

# **BROADWATER**



**BROADWATER ENERGY LLC  
LONG ISLAND SOUND PROJECT**

**SUPPLEMENT TO THE  
APRIL 2006 NEW YORK STATE  
COASTAL ZONE CONSISTENCY CERTIFICATION**

**OCTOBER 2006**

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## 1.0 Introduction

Broadwater Energy is pleased to submit this supplement to the Coastal Zone Consistency Certification ("CZCC") which it filed with the New York State Department of State ("NYSDOS") on April 4, 2006 related to Broadwater's proposal to construct and operate a marine liquefied natural gas ("LNG") terminal and subsea connecting pipeline for the importation, storage, regasification, and delivery of much-needed natural gas to the target markets of Long Island, New York City, New York City metropolitan area and Southern Connecticut (the "Project"). The proposed LNG terminal will be a floating storage and regasification unit ("FSRU") located in Long Island Sound, prudently situated approximately 9 miles from the shore of Long Island in New York State waters. Broadwater is submitting this supplement at this time to identify certain aspects of the *U.S. Coast Guard Captain of the Port Long Island Sound Waterways Suitability Report for the Proposed Broadwater Liquefied Natural Gas Facility*, September 21, 2006 (the "WSR") applicable to the coastal resources and uses addressed in the April 2006 CZCC.

The WSR confirms the information provided by Broadwater in its April 2006 CZCC and further supports the conclusion that the Project is consistent with the Long Island Sound ("LIS") Coastal Management Plan ("CMP") and other applicable CMP policies. More specifically, the WSR concludes, consistent with the conclusions set forth in the April 2006 CZCC, that the:

- Long Island Sound is a mixed use waterway shared by recreational, commercial, military and fishing interests;
- Long Island Sound and Block Island Sound are suitable for LNG carrier traffic and the operation of the Project from a navigation and maritime security perspective and that the potential navigation safety and maritime security risks associated with the Project are manageable;
- Proposed location of the Project has significant safety and security benefits and lessens the Project's attractiveness as a terrorist target when compared to those in other locations or using other technologies;
- FSRU is located in proximity to but not within existing commercial shipping channels;
- LNG carriers transiting to and from the Project would increase commercial usage of the Sound by less than 1%;
- Safety/security zones around the FSRU will occupy only a small fraction (0.12%) of the total area of LIS;
- Temporary safety/security zones around the LNG carriers will only occupy any given point for a short duration of time; and
- Impacts of the safety/security zones around the LNG carriers on The Race are manageable.

Taken together, these aspects of the WSR support Broadwater's conclusions that the Project is consistent with the policies of the CMPs applicable to the Project. Where appropriate, Broadwater has updated Chapter 4 of the April 2006 CZCC to support this assertion.

The WSR also recommends safety/security zones for the FSRU and specifies the route for the LNG carriers delivering cargo to the Project. With respect to the safety/security zones, the April 2006 CZCC contemplated and addressed how the safety/security zones then expected to be promulgated by the Coast Guard would correlate to New York's coastal uses resources and policies. Although the CZCC did not identify the precise size of the safety and security zones recommended in the WSR, it did make reasoned size estimates of the zones and, thereafter, evaluated consistency with the applicable CMP policies based upon the then-estimated size of the zones. Now that the WSR has been issued, Broadwater has revised Appendices E and F of the CZCC to reflect the safety and security zones recommended by the Coast Guard in the WSR. The primary changes to these Appendices relate to the Coast Guard's recommendation for a 1,210 yard safety zone around the FSRU. WSR § 4.6.1.5. The substantive conclusions reached in the CZCC and these appendices with respect to coastal effects of the safety/security zones associated with the now existing coastal uses and resources and consistency with applicable CMP policies remain unchanged. Broadwater anticipates that the Coast Guard will provide a negative determination or, in the alternative, a consistency determination which addresses the coastal effects of the safety/security zones, the waterways impacted by the zones (including LIS), and the consistency of the zones with applicable CMP policies. Broadwater also has supplemented the carrier route analysis in Appendix J of the CZCC to identify the minor difference between the carrier routes described in Appendix J and the carrier routes recommended by the Coast Guard in the WSR.

## **2.0 Major Conclusions Of The WSR**

### **2.1 The Coast Guard's Development of the WSR**

The Coast Guard prepared the WSR in support of its independent statutory authority under the Magnuson Act, the Ports and Waterways Safety Act, the Maritime Transportation Security Act and its responsibility as a cooperating agency under the National Environmental Policy Act ("NEPA"). The WSR details the objective process followed by the Coast Guard to develop the WSR and the conclusions reached therein. The process included, among other things, the preparation of a Ports and Waterways Safety Assessment in May 2005 to provide a baseline for analysis of navigational safety concerns for Long Island Sound. In developing the WSR, the Coast Guard also sought and obtained input from: (1) a Harbor Safety Working Group consisting of representatives of commercial, recreational and government waterway users as well as state and local agencies with responsibility related to waterway safety; (2) a subcommittee of the LIS Area Maritime Security Committee consisting of representatives of federal, state and local agencies with responsibilities related to maritime security; and (3) "extensive" public input through written comments submitted to the Coast Guard dockets and during public scope meetings. WSR §§ 1.2 and 8.1. According to the Coast Guard, "as the lead federal agency responsible for waterway safety and maritime security, the Coast Guard's recommendation is based solely on an objective assessment of whether the waterway is suitable for LNG marine traffic and the operation of the proposed FSRU." WSR § 8.1.

## **2.2 Key Analyses Performed by the Coast Guard as Part of the WSR**

### **2.2.1 Hazard Zone Analysis**

Essential to the Coast Guard's assessment of the suitability of Long Island Sound and Block Island Sound for marine LNG activities and the suitability of the proposed location of the FSRU was the determination of potential hazard zones related to large releases of LNG from the FSRU or an LNG carrier.

The Coast Guard looked to the criteria used by Sandia National Labs in their report, *Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water* (December 2004), to develop the three hazard zones and then used the hazard zones to assess the potential risks associated with the Project. WSR § 1.4.1.

Within the three zones, the level of risk reduces with an increasing distance from the source. For Zones 1 and 2, the outer limits are defined as the thermal radiation impacts (high potential or potential for major injuries or damage) that could be expected from an intense LNG vapor fire. Id. The outer limit of Zone 3 is based on the lower flammability limit of LNG vapor (i.e., the point at which a vapor cloud would disperse that it cannot be ignited). Id.

### **Summary of Waterways Suitability Report Findings**

The primary difference between the evaluations contained in the Sandia Report and those in the WSR relate to differences between the size of the LNG carriers considered by Sandia and those proposed by Broadwater. The size of the three hazard zones reported in the Sandia Report were based on large releases of LNG from LNG carriers with a capacity of 138,000-144,000 m<sup>3</sup>. The individual tank capacities were approximately 25,000 m<sup>3</sup>. The Sandia study assumed that about one-half of the tank volume was released, or 12,500 m<sup>3</sup>. *Sandia National Laboratories Report SAND2004-6258: Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water*, 2004, p. 141.

By way of contrast, the tank sizes for the FSRU and the maximum proposed LNG carrier size for the project (250,000 m<sup>3</sup>) are somewhat larger (approximately 42,000 to 45,000 m<sup>3</sup>) and therefore the volume of a potential release and the subsequent hazard zones will be somewhat larger than those estimated in the Sandia Report. WSR § 1.4.4.

The Federal Energy Regulatory Commission (FERC) conducted the consequence assessment for the WSR and conservatively determined that for the FSRU and the LNG carriers each of Zones 1 and 2 should be approximately 32 to 35% or 16 to 18% respectively larger than those established in the Sandia Report to account for larger potential spill volumes from the Project. Id.

The results of the Coast Guard's assessment conclude that because the FSRU is located in the central Sound none of Hazard Zones 1, 2 or 3 would overlap any portion of land. It was also concluded that no land areas along the LNG carrier transit route would fall within Hazard Zones 1 or 2. WSR §3.2.

Hazard Zone 3, which carries the least level of risk and conservatively extends out to 4.3 miles from the moving LNG carrier, would overlap the following land areas:

- Northern tip of Block Island, Rhode Island;
- Southern tip of Weekapaug Point, Westerly, Rhode Island;
- Southern tip of Watch Hill, Rhode Island;
- All of Fisher's Island, New York;
- All of Plum Island, New York;
- Northernmost third of the North Ford of eastern Long Island; and
- A portion of Goshen Point straddling the City of New London and the town of Waterford.

Id.

### **Hazard Zone 3 Discussion**

A further discussion of Hazard Zone 3 is appropriate. The analysis of this hazard zone followed the guidance provided in the Sandia Report for an intentional breach scenario. It should be noted that this assessment considers only the *consequence* of such a breach scenario, and does not consider the *probability* of occurrence of such a scenario. The Sandia Report's analysis made the following assumptions:

- A 5 m<sup>2</sup> hole size. This is a hole approximately 8 feet in diameter in a double-hulled LNG carrier. In the course of the Coast Guard's review, Broadwater submitted an evaluation of design data from different sized LNG carriers showing that larger future generation LNG carriers and the FSRU will have thicker inner and outer hull plate thickness and a larger horizontal distance between the outer and inner hulls compared to smaller LNG carriers currently in service, rendering large carriers less vulnerable to hull damage. This is therefore a conservative assumption. *Det Norkse Veritas for Broadwater Energy - Response to U.S. Coast Guard Letter Dated December 21, 2005, Report No. 70014347*, February 13, 2006, pp. 2-5.
- Intentional breach of 3 separate tanks.
- No ignition when the breach occurs. This is a conservative assumption, as the Sandia Report states: "*Most of the intentional damage scenarios identified produce an ignition source such that an LNG fire is likely to occur immediately.*" *Sandia Report*, p. 73. If the breach is ignited, the smaller Hazard Zones 1 and 2 are applicable.
- Calm atmospheric conditions, allowing the maximum drift of the vapor cloud. If the atmospheric conditions are less stable, the LNG vapor cloud will disperse more quickly and the extent of the vapor cloud will be reduced. Based on a review of annual average data for 1994 to 2004 by

Broadwater, it was determined that the stable atmospheric conditions assumed in the Sandia Report only occur about 15% of the time.

The high degree of conservatism in this scenario is acknowledged in the Sandia Report, which states:

*While previous studies have addressed the vapor dispersion issue from a consequence standpoint only, the risk analysis performed as part of this study indicates the potential for a large vapor dispersion from an intentional breach is highly unlikely. This is due to the high probability that an ignition source will be available for many of the initiating events identified, and because certain risk reduction techniques can be applied to prevent or mitigate the initiating events identified. Sandia Report, p. 53.*

Similar conclusions pertain to the application of this intentional breach scenario to the Broadwater Project.

### **Summary of Potential Coastal Zone Effects**

In conclusion, while the WSR assessed an intentional breach scenario that was generally consistent with that outlined in the Sandia Report, the potential for Hazard Zone 3 to impact land along the LNG carrier route is highly unlikely, due to the following:

- (1) The unlikely occurrence of the simultaneous intentional breach of three tanks without any spark that would cause ignition.
- (2) The limited occurrence of stable (F stability class) atmospheric conditions in Long Island Sound.
- (3) The established safety record of LNG carriers: "Over the approximately 45 years since the first marine shipment of LNG, more than 33,000 LNG carrier voyages have taken place. Transport of LNG in vessels has an excellent safety record: only eight marine incidents worldwide have resulted in LNG spills, some with damage. No cargo fires have occurred." WSR § 3.1.4.
- (4) The lack of credible terrorist threats against the facility. The WSR notes that "There are no known, credible threats against the proposed Broadwater Energy facility." WSR § 8.2.
- (5) The unlikelihood of the facility being considered a terrorist target, as noted by the Coast Guard in the WSR:

*"The current threat environment indicates a primary factor in the selection of targets by a terrorist organization such as al-Qa'ida is whether an attack could result in a significant loss of life. Another factor is that the target is readily accessible to the media so that the images of the attack can be quickly seen throughout the country and the world."*

*"There would normally be between 30 and 60 persons on the FSRU and between 20-25 crewmembers on an LNG carrier. While an attack against the FSRU or an LNG carrier would possibly result in loss of life, the proposed location is sufficiently remote that hazards Zones 1, 2, or 3 would not affect shoreside population centers. Second, the proposed location of the FSRU is relatively remote given the distance from shore and would not be broadly and readily accessible to the media or public. Based on the above two criteria, the Broadwater Energy FSRU would more than likely not be an attractive terrorist target." WSR § 5.2.1.*

### **2.2.2 Waterway Characterization**

Another analysis which was essential to the Coast Guard's analysis of the suitability of LIS and Block Island Sound for LNG marine traffic and the operation of an LNG marine terminal was the characterization of these waterways and the assessment of the potential effects of the Project on these waterways. WSR § 2.0. To this end, the WSR sets forth an exhaustive analysis of the waterways potentially effected by the Project. The analysis included an assessment of: (1) port activity (e.g., commercial vessel traffic, commercial vessel size and tonnage, traffic flow, vessel transit proximity, recreational boating, marine events, and Coast Guard regulated facilities); (2) regulatory requirements for vessel operation and transit within the Captain of the Port Long Island Sound Zone; and (3) weather. WSR § 2.1. The WSR then characterizes the potential effects of the Project on these waterways, evaluating the effects associated with the proposed location for the FSRU, the onshore facilities, and the recommended transit routes for the LNG carriers separately. WSR § 3.0.

The WSR assesses the waterway attributes, weather, and the density and character of the marine traffic at the proposed location of the FSRU. WSR § 3.1. With respect to waterway attributes, the WSR concludes that there are no natural or manmade obstructions near the FSRU which could affect FSRU operation or transit of LNG vessels to the FSRU. WSR § 3.1.2.1. The WSR also concludes that the proposed location would offer "natural protection from conditions on the high seas, and sea conditions are generally calmer than those encountered off the south shore of Long Island and within Block Island Sound." WSR § 3.1.2.2. According to the WSR, the proposed location of the FSRU also would not be within the predominance of existing commercial and recreational uses of the Sound. WSR § 3.1.2.3. In particular, the WSR provides that the "predominance" of east-west traffic transits to the south of the proposed location and the concentration of commercial traffic running from north to south is located to the east of the FSRU. Id. The WSR also notes that the highest density of recreational boating is generally within 2.3 to 3.5 miles of the shore on both coasts of Long Island Sound, and that most marine events are held close to shore. Id.

The WSR also breaks down the recommended LNG carrier transit route into eight segments and evaluates each segment against the following criteria: (1) weather; (2) port characterization; (3) density and character of marine traffic; (4) zones of concern in the Sandia Report; (5) sensitive environmental receptors; and (6) population density. WSR § 3.2. While the

WRS's analysis of each criterion varies somewhat based upon the segment, the following key conclusions can be drawn from the information provided in the WSR:

- Water depths and other waterway restrictions are generally not a concern for LNG carriers transiting the segments of the recommended LNG routes. In addition, while certain areas are more navigationally constrained than others (i.e., The Race), the recommended route for the LNG carriers is similar to that of other deep draft vessels and generally is not used as a route by smaller commercial vessels or recreational vessels;
- While certain segments of the route present tidal currents and weather conditions which are similar to the open ocean, as the LNG carriers are designed for operation of the high seas, tidal conditions are not expected to interfere with the navigation of the LNG carriers;
- The segments of the recommended LNG carrier route already are subject to commercial, recreational, and military traffic, the density of which varies depending upon the segment. As a result, the introduction of LNG carriers along this route is not expected to change the "use" characteristics along the recommended route segments;
- Some of the segments are subject to seasonal increases in recreational and commercial traffic and certain marine events impact some or all of the recommended LNG carrier routes;
- The population density, important community structures, and sensitive environmental areas vary by segment; and
- No shoreline along the recommended routes is within Hazard Zone 1 or Hazard Zone 2, and only portions of the shoreline along the recommended route are within Hazard Zone 3. As a result, the recommended LNG carrier route avoids effects on the shoreline in all but the most conservative and low-probability risk scenarios.

See generally WSR § 3.2. These conclusions are consistent with and support the conclusions reached by Broadwater in the CZCC and further demonstrate that the Project is consistent with applicable coastal policies.

### **2.2.3 Safety and Security Assessments**

The WSR also sets forth a comprehensive assessment of the safety and security risks associated with the Project and transiting LNG carriers, and provides recommendations on the mitigation measures that are necessary to address these risks. These assessments, coupled with the hazardous zone analysis and waterway characterization discussed above, formed the basis for the Coast Guard's recommendation that the waterway was suitable for LNG marine traffic and the operation of the FSRU, provided that measures were implemented to responsibly manage the safety and security risks associated with the Project.

### **2.2.4 Key Aspects of the WSR Support Broadwater's Conclusion that the Project is Consistent with Applicable CMP Policies**

The conclusions reached by the Coast Guard in the WSR with respect to the navigational safety and maritime security aspects of the Project support key findings set forth in the CZCC and further demonstrate that the Project is consistent with the applicable LIS CMP policies. To this end, Broadwater has supplemented Chapter 4 of the CZCC to incorporate, where appropriate, the Coast Guard's findings. In summary, Broadwater believes that the following conclusions of the Coast Guard in the WSR further demonstrate that the Project is consistent with applicable CMP policies:

- LIS is a mixed use water body shared by recreational, commercial, military, and fishing interests with heavy commercial traffic servicing ports located on both the Connecticut and New York side of LIS, including the Riverhead and Northport Terminals;
- The addition of the proposed LNG carriers to LIS would increase commercial usage of the Sound by less than 1% and, as a result, the Project is not expected to unnecessarily congest or impede existing commercial vessel traffic in LIS, even in The Race;
- While LIS currently does not have LNG carrier traffic, numerous large vessels operate routinely in LIS, including deep draft vessels exceeding 800 feet in length which generally carry liquid petroleum product or coal;
- The site selected for the Project has several significant safety and security benefits due to its remote distance from population centers when compared to those in other locations or using other technologies;
- The site selected for the Project is outside of existing commercial vessel thoroughfare and, as a result, the Project will not interfere with existing commercial vessel traffic patterns;
- The Coast Guard has established or proposed to establish safety/security zones within LIS, and the safety/security zone recommended for the Broadwater FSRU will cover an extremely small percentage (0.12%) of the total area of LIS;
- The temporary safety/security zones proposed for around the LNG carriers will only occupy any given point for a short duration of time; and



- The effects of the Project and transiting LNG carriers on recreational activities will be minor as the majority of recreational vessel traffic is close to shore and not in proximity to commercial shipping lanes or the site selected for the Project.

### **3.0 Conclusion**

Broadwater's April 2006 CZCC demonstrates that the Project is consistent with applicable CMP policies. The Coast Guard's conclusions in the WSR supports, without contradiction, several conclusions set forth in the CZCC, including but not limited to: (1) the historic and current commercial uses of the Sound; (2) the Project's effects navigational safety and maritime security in the Sound; (3) the Project's effects on existing commercial/industrial and recreational uses of the Sound; and (4) the relatively benign risks of the Project after the implementation of the mitigation measures set forth in the WSR. As a result, Broadwater respectfully requests that the NYSDOS make the finding that the Project is consistent with applicable CMP policies.

## 4.0 Consistency With New York State's Coastal Management Program

New York State's Coastal Management Program (State CMP) consists of 44 policies that are designed to ensure the appropriate use of the coastal zone, which is defined as within up to 1,000 feet of the waterfront. A project applicant must make an initial showing of consistency with each of the 44 policies of the State CMP. The applicant's determination is then subject to either a concurrence or objection by the New York State Department of State (NYSDOS).

New York has also developed and approved a separate and distinct coastal management program for Long Island Sound. The Long Island Sound Coastal Management Program (LIS CMP) "refines" the state CMP and incorporates programs and laws governing coastal activities within Long Island Sound. The LIS CMP generally replaces the State CMP for the Sound shorelines of Westchester County, New York City to the Throgs Neck Bridge, Nassau County, and Suffolk County. Thus, the LIS CMP sets the parameters for evaluating the consistency of a project -- such as Broadwater -- that is proposed for Long Island Sound unless there is an approved Local Waterfront Revitalization Program ("LWRP"), in which instance, the LWRP primarily applies.

The LIS CMP identifies four distinct and interrelated coasts -- the developed coast, the natural coast, the public coast, and the working coast -- and establishes "specially tailored standards that define what constitutes a balance between appropriate and needed economic development and protection and restoration of the natural and living resources of the Sound." (LIS CMP, Introduction at 1, 3). Broadwater addresses each of the 13 specific policies of the Long Island Sound Coastal Management Program under this analytical rubric below. Broadwater also addresses the approved LWRPs<sup>1</sup> from Southold, Greenport, Smithtown and Lloyd Harbor.<sup>2</sup> As part of its CMP analysis, Broadwater addresses the Port Jefferson Harbor

<sup>1</sup> Broadwater respectfully submits that its analysis of the Broadwater Project's consistency with the policies and/or objectives of DOS- and federally approved programs and plans under the state CMP, including LWRPs and Harbor Management Plans (HMPs), is subject to and without waiver of any rights that Broadwater has or may have regarding the applicability or non-applicability of such LWRPs and/or HMPs with regard to part or all of the Broadwater Project.

<sup>2</sup> Broadwater's analysis of the Village of Lloyd Harbor LWRP is incorporated into Broadwater's analysis of the 44 policies of the State CMP because the Lloyd Harbor LWRP draws upon those policies. The Village of Lloyd Harbor is more than 30 miles from the location of the proposed FSRU and will be screened from the Broadwater Project by intervening landforms. Because the Broadwater Project will not be visible from Lloyd Harbor and does not otherwise impact Lloyd Harbor or its LWRP, Broadwater respectfully submits that a separate analysis of the Broadwater Project's consistency with the Lloyd Harbor LWRP would be substantially duplicative of Broadwater's state CMP analysis. To the extent, however, that NYSDOS advises Broadwater otherwise as to Lloyd Harbor or any other potentially applicable and enforceable LWRP or other program, Broadwater reserves the right to submit additional information, and the level of such information in this submission shall not be deemed a waiver of or prejudice to Broadwater's right to submit such additional information. Also, and in accordance with the directives of the NYSDOS, Broadwater does not address LWRPs that have not yet been DOS- and federally-approved, but which, if approved, would be potentially enforceable as to the Broadwater Project, including those draft LWRPs for the Town of Riverhead and the Village of Port Jefferson. As of the date of this submission, neither the Port Jefferson nor Riverhead LWRPs have been approved by DOS.

Complex Harbor Management Plan and the Long Island North Shore Heritage Area Management Plan. Last, Broadwater analyzes the policies of the State CMP to demonstrate the Project's conformance with each of the 44 policies that may apply where the LIS CMP, LWRPs, or other aspects of New York's coastal management program do or may not apply.

#### **4.1 Policies of the Long Island Sound Coastal Management Program**

**POLICY 1:** *Foster a pattern of development in the Long Island Sound coastal area that enhances community character and preserves open space, makes efficient use of infrastructure, makes beneficial use of coastal location, and minimizes adverse effects of development.*

- 1.1 *Concentrate development and redevelopment in or adjacent to traditional waterfront communities.*
- 1.2 *Ensure that development or uses take appropriate advantage of their coastal location.*
- 1.3 *Protect stable residential areas.*
- 1.4 *Maintain and enhance natural areas, recreation, open space and agricultural lands.*
- 1.5 *Minimize adverse impacts of new development and redevelopment.*

The Broadwater Project is consistent with and furthers the objectives of LIS CMP Policy 1 because it will introduce a reliable supply of new natural gas to the region, satisfying a manifest need for additional, cleaner-burning energy sources that are required to promote patterns of development that will protect and enhance the character of Long Island's coastal communities. The Broadwater Project offers a compelling solution to the ever-growing demands in the Long Island, New York City, greater New York City metropolitan, and Southern Connecticut markets for a competitively-priced, reliable, and cleaner-burning fuel supply. This supply, which will be used by the residences and businesses, municipal governments, commerce, schools, and hospitals in the target markets, will also enable existing coal- and oil-fired electric generating facilities to repower using clean-burning and cost-effective natural gas. The end result will be increased energy reliability and regional power generation, and reduced impacts on the natural resources that so greatly contribute to the character of Long Island's coastal communities.

Simply put, Broadwater's introduction of a new, reliable natural gas supply will sustain and promote growth that is consistent with the objectives of enhancing community character, preserving open space, maximizing use of infrastructure, and minimizing adverse effects of development. In addition, the Broadwater Project itself -- its design, location, and operations -- will be consistent with these objectives. For all of the reasons fully set forth herein, the Broadwater Project is consistent with LIS CMP Policy 1.

#### ***The Manifest Need for the Broadwater Project***

There is an undeniable need for the availability of a new fuel supply into the regional market in and around the Long Island Sound. Broadwater's introduction of a new gas supply into this regional market will encourage patterns of development that will protect and

enhance the character of Long Island's coastal communities. For example, the Long Island, New York City, and Southern Connecticut regions combined presently consume approximately 20 percent of the total gas consumption of the Northeastern U.S. and Eastern Canada ("NEEC") markets -- an estimated 700 billion cubic feet (bcf)/year. Average daily demand in Long Island, New York City, the greater New York City metropolitan area, and Southern Connecticut is anticipated to grow from 1.8 billion cubic feet per day (bcfd) in 2005 to 2.6 bcfd in 2025. Peak daily demand in this region, which was 3.3 bcfd in 2005, is expected to grow to 4.6 bcfd by 2025. These figures confirm the substantial, existing regional demand and the significant increased needs in the near future. Conservation measures alone, which are estimated to only provide about 130 million cubic feet per day (mmcf) natural gas savings by 2022, will clearly be insufficient to address these forecasted energy needs. A forward-looking, permanent, proven solution to address this growing need must be implemented now.

### *Land and Marine Use Patterns Around the Long Island Sound*

Broadwater's capability to provide reliable supplies of natural gas at a competitive price is paramount to sustaining and promoting development and uses of land and marine resources that are consistent with the historic and current patterns that establish community character. A review of relevant data and use patterns confirms the legacy of mixed commercial, residential, recreational and industrial uses within Long Island's coastal communities and the Sound. Significantly, the vessel traffic within the Sound has long included waterborne transportation for the delivery of a substantial portion of the region's energy supply, including petroleum and coal. One of the major findings of the Coast Guard's Waterways Suitability Report (WSR) prepared for the Project was that LIS is a mixed-use waterway shared by commercial, fishing, military and recreational interests. WSR §§ 2.2.1 and 8.2. Notably, the WSR identifies 34 existing marine oil facilities within LIS subject to regulation by the Coast Guard. WSR § 2.2.4.

A discussion of land and water use patterns and trends for Long Island and the Sound generally, and, more particularly, in those communities in which Broadwater's onshore facilities will be located, is set forth below.

### *Land Use and Development Patterns in Long Island's Coastal Communities*

Land uses in the Sound coastal area are largely dependent upon where on Long Island they are located. Generally, population and overall development is less dense on eastern Long Island in the coastal areas directly south and east of the proposed Broadwater Project (e.g., eastern Suffolk County). Eastern Long Island comprises a mix of agriculture, open space, and rural/low density residential development. While some densely developed commercial/industrial uses occur along eastern Long Island (outside of organized maritime centers), the more intense urban development occurs primarily in the defined maritime centers such as Port Jefferson and the Village of Greenport (*see* Figures 35 through 38), where the Broadwater Project's on-shore facilities will be located. Applicable zoning and land use patterns for these communities confirm the consistency and compatibility of Broadwater's onshore support facilities.

### ***Land Use and Development Patterns -- Village of Greenport***

The proposed site for onshore support facilities in the Village of Greenport is located within the Long Island Sound Coastal Zone Management Area, as well as within the boundaries of the Village of Greenport's federally and DOS-approved Local Waterfront Redevelopment Plan ("Greenport LWRP"). These aspects of the Broadwater Project are thus evaluated under the Greenport LWRP for coastal zone consistency. Broadwater's Greenport LWRP analysis, which confirms the consistency of the Broadwater Project, is contained later on in this Chapter.

The goals of the Greenport LWRP are to protect and maintain water-dependent uses, revitalize underutilized waterfront areas, strengthen Greenport as a commercial fishing seaport, provide for public access to the waterfront, and enhance the Village as a commercial and business center (U.S. Office of Ocean and Coastal Resource Management [OCRM] 1996). Because the Broadwater Project's proposed waterfront facilities will be used for the transfer of people, equipment, and the transit of support vessels between land and the Broadwater LNG terminal, Broadwater's use is water-dependent and consistent with the objectives of the Greenport LWRP. Due to the flexibility in siting the other onshore facilities (i.e., office space and warehousing capabilities), and the ability to use existing infrastructure, Broadwater has not yet identified specific locales for these additional ancillary facilities.

Furthermore, the scope of construction, operation and maintenance of Broadwater's onshore, water-dependent support facilities are consistent with Greenport's LWRP, existing zoning and development patterns for other reasons as well. Greenport has a long history as a commercial fishing port reaching back to the early 1800s. Although the current local economy relies less on the waterfront's traditional use as a commercial fishing/maritime center and more on waterfront-related tourism and recreational uses, land use patterns in Greenport are still oriented toward traditional water-dependent uses, and the Village has identified plans and programs geared toward the efficient use of the waterfront for water-dependent uses (OCRM 1996).

The proposed permanent Broadwater-related facilities are consistent with the Greenport LWRP. The specific parcels proposed for these facilities are designated as Waterfront Area 1 and Waterfront Area 2, which include the following mix of land uses: marine commercial (9.2 acres [56.9%]), vacant disturbed abandoned (2.8 acres [17.2 %]), institutional (0.39 acres [2.4%]) and commercial (3.8 acres [23.5%]) (*see* Figure 35). The surrounding uses include commercial and marine commercial to the north, village residential to the west and south, and open water (Greenport Harbor) to the east (OCRM 1996). According to the Greenport LWRP, marine commercial uses in Waterfront Areas 1 and 2 currently include a variety of water-dependent businesses and activities, including but not limited to: retail and wholesale seafood product manufacturers, facilities for offloading fish from commercial vessels, dockage for transient vessels, and marine supply facilities (OCRM 1996).

The proposed permanent Broadwater-related facilities are also consistent with local zoning and future land use planning. The Greenport site is currently primarily zoned W-C: Waterfront Commercial. A small portion is zoned C-R: Retail Commercial (*see* Figure 36). Other zoning designations adjacent to the proposed site include R-A and R-B2 (Residential) to the east and west, and C-1 (Central Commercial) to the south. The W-C zoning designation

allows for uses supporting water-dependent uses such as marinas and docks. Under the Village of Greenport's future land use map, the proposed onshore facilities are located in an area designated as marine commercial.

Thus, based on existing usage, the uses proposed for the onshore Broadwater facilities -- the transfer of people, goods, and support vessels to and from the LNG terminal -- are expected to be consistent and compatible with the LWRP, existing zoning, and future land use patterns in the area. (OCRM 1996).

### ***Land Use and Development Patterns --Village of Port Jefferson***

The proposed location for Broadwater's onshore, support facilities in the Village of Port Jefferson is also within the Long Island Sound coastal area. Port Jefferson does not have an approved LWRP (see New York State Coastal Management Program LWRP Status Sheet February 1, 2006). Port Jefferson does have an HMP, which Port Jefferson and local municipalities bordering the Port Jefferson harbor complex adopted in 1999. The Port Jefferson HMP provides an environmental, ecological, and natural resources evaluation of the Port Jefferson harbor and identifies existing sources of impacts on sensitive harbor resources. In the absence of an approved LWRP, the HMP is also used by the bordering municipalities as a planning tool to inform future development within the HMP area and the surrounding coastal area.

The majority of the location in the Village of Port Jefferson that has been proposed for Broadwater onshore uses consists of marine commercial/industrial shoreline type parcels. Sensitive ecological resources in the region, which include large bluffs occurring in various locations adjacent to the Port Jefferson Harbor shoreline and adjacent to portions of the potential onshore Project facilities area, are not anticipated to be impacted by construction and operation of the Broadwater Project because Broadwater's onshore facilities will be located in buildings that are existing and already constructed. Broadwater does not propose construction for its onshore facilities that would affect sensitive ecological resources that are along the Port Jefferson Harbor shoreline. In addition, as the natural areas are located away from the commercialized waterfront area and the proposed facilities will be consistent with ongoing activities (commercial marina, boat storage and aggregate transshipments) within the Port Jefferson Harbor area.

The historic use of Port Jefferson's waterfront has been primarily industrial. According to the Port Jefferson HMP, there has been a slow transition of Port Jefferson Harbor from primarily industrial waterfront use to one characterized by a mix of uses, including recreational, commercial, industrial, and residential. Current land uses adjacent to the proposed Project site include a mix of industrial uses to the north and west (including the KeySpan Power Plant), medium - to high-density residential use to the north and southwest, and open water (Port Jefferson Harbor) to the east.

Broadwater's proposed onshore facilities are consistent with existing land use patterns (see Figure 37), commercial and industrial uses and zoning within the Village of Port Jefferson, and are allowable and encouraged under the Village's and Town's planning documents (Village of Port Jefferson 1999). The Port Jefferson site is currently zoned primarily as M-W: Marina Waterfront (see Figure 38). The M-W zoning designation allows for uses

supporting water-dependent uses such as marinas and docks. Other surrounding zoning includes C-G: General Commercial to the south and R-2: One- and Two-Family Residential to the west and east (Suffolk County Planning Department 1997). Therefore, the facilities proposed to support the Project will be consistent with existing zoning.

The Port Jefferson HMP also states that because the amount of commercial waterfront is limited and concentrated in specific areas, priority for development should be given to water-dependent and water enhanced uses in these areas in order to provide the greatest economic benefits. [HMP at 30] In the Harbor Issues and Recommendations section of the HMP, Harbor Objective No. 1 states that the existing uses in lower Port Jefferson Harbor (in the area of the proposed Broadwater onshore facility), such as "boat yard dockage; ... transshipment and oil transfer facilities, and ... marinas," are of "vital importance to the economic vitality and historic character of the Village of Port Jefferson and should be enhanced" in a manner consistent with the protection of natural resources in the area spanning Port Jefferson Harbor (HMP at 100). Broadwater's proposed onshore facilities will be consistent and compatible with this express recommendation of the Port Jefferson HMP.

In addition to zoning codes pertaining to land use in the Sound, marine use, including vessel traffic, is a fundamental component that contributes to the Sound's character as a vibrant mixed-use region supporting a wide range of commercial, industrial, residential and recreational activities. A discussion of the importance of the Sound's waters for commerce and recreation alike, is set forth below.

### *Marine Vessel Traffic*

With its many major ports in both New York and Connecticut, Long Island Sound has long been an area of major marine vessel traffic and is a multi-purpose waterway. **The WSR categorizes the entire transit route of the LNG carriers as a multiple use waterway which includes commercial, military, fishing and recreational interests. See WSR §§ 2, 2.2, 2.2.1, 2.2.3, 3.2 and 8.2.** As shown in Table 34 below, thousands of vessels supporting regional commerce/industry traverse the Sound on an annual basis on both sides of the Sound. Approximately 46 million tons of petroleum and coal are moved by marine means in Long Island Sound annually. This statistic is significant because it illustrates that Broadwater's proposal to import approximately 7 million tonnes per year of LNG by waterborne LNG carriers is wholly compatible with existing marine vessel uses of Long Island Sound. Tankers currently traversing the Sound also carry oil and chemicals; Table 25 presents 2003 commercial vessel traffic counts for deepwater ports in Long Island Sound. **The WSR states that deep draft vessels transiting the Sound range in size from 500 to 902 feet and that those in excess of 800 feet in length generally carry liquid petroleum or coal. WSR § 2.2.1.1.** Commercial shipping in the Broadwater Project area mainly involves vessels arriving and departing the ports of Northport, Northville, and Asharoken, New York, and Bridgeport and New Haven, Connecticut. Based on U.S. Army Corps of Engineer ("USACE") data, the Connecticut ports receive significantly more traffic than the New York ports. In New York, Asharoken registers approximately 150 vessels per year, Northville registers over 500 vessels per year, and Northport has 24 vessels calling approximately on a monthly basis. In addition to these ports, which can accommodate deeper draft vessels, Port Jefferson's port also has significant commercial/industrial traffic. Its port, however, cannot support deeper-draft vessels, and as such is serviced by smaller vessels.

In addition, and directly relevant to compatibility and suitability analyses, two offshore oil platforms are located in the Sound -- the Tosco Corporation's Riverhead Terminal Offshore Wharf offshore of Northville, New York, and KeySpan Energy's Northport Power Plant Offshore Fuel Wharf northeast of Northport, New York. These fixed oil platform facilities routinely receive oil tanker traffic for specified periods of time and are substantially closer (within 1.5 miles of the coastline) to the Long Island coastline than Broadwater's proposed floating storage and regasification unit ("FSRU"). ConocoPhillips also operates an offshore petroleum unloading terminal approximately two miles off the coast of the Town of Riverhead. The Broadwater Project is consistent with these already-existing commercial/industrial uses.

In the absence of a marine traffic-routing scheme in Long Island Sound, federal navigational aids and standard marine practices have led to the development of established traffic patterns and generalized shipping routes in the Sound. The main shipping route runs generally down the center of the Sound on a straight course from deepwater areas in the eastern Sound to the deepwater pass through Stratford Shoal, with a secondary shipping route trending from northeast to southwest toward Northport, New York. Vessel traffic branches off the main shipping route to enter deepwater ports (*see* Figure 29).

**Table 34 Commercial Vessel Traffic in Long Island Sound (2003)**

Deepwater Ports	Vessel Trips Per Year	Transit Tankers
Bridgeport, CT	21,588	27
New London, CT	10,564	10
New Haven, CT	3,603	469
Northville, NY	1,207	31
Asharoken, NY	282	11
New York, NY**	50	50
Northport, NY	24	Unknown

\* Foreign and domestic traffic were totaled for deepwater ports; fishing vessels and escort tugs were not included.

\*\* While 21,789 vessels were reported for New York Harbor, the majority of these vessels do not approach through Long Island Sound due to extreme currents.

The available trend data from local and regional planning and development documents as well as a review of commercial shipping and port data confirm that recreational uses and high end residential development do not present the sole development patterns and trends within the Long Island Sound coastal region. In fact, the data in the Long Island Sound Waterborne Transportation Plan shows that historic water-based commercial/industrial activities (i.e., use of the Sound for waterborne freight transportation) continue to be balanced with the Sound's development as recreational resource.

In addition, in both the maritime centers of New York (inclusive of Port Jefferson) and Connecticut (e.g., Bridgeport, New Haven, and New London), historic commercial/industrial uses are not only continuing, but are expanding. For example, of the top five regional commodities that are transported within Long Island Sound (generally categorized as petroleum/coal, clay/concrete, distribution/warehouse, food, and chemicals<sup>3</sup>), transportation of

<sup>3</sup> Long Island Sound Waterborne Transportation Plan.



petroleum and oil make up 95% of all Long Island Sound vessel traffic. Vessel traffic is anticipated to grow approximately 1.7% per year from 2000 through 2025. These data regarding the historic and continued reliance on the Sound confirm its pivotal role as a center of water-based and water-dependent commerce and industry and support the decision to site the compatible and suitable Broadwater Project in the Long Island Sound.

### ***Consistency with Policies of Other Long Island Sound Plans***

Broadwater has identified other plans and programs developed to further the protection and preservation of the Long Island Sound, adjacent coastlines, and coastal communities. These include:

- Long Island Sound Comprehensive Conservation and Management Plan
- Long Island North Shore Heritage Area Management Plan; and
- Finalized and Approved LWRPs and HMPs.

Broadwater's analysis of potentially applicable and enforceable LWRPs and HMPs are presented in Section 4.2. A brief discussion confirming the Broadwater Project's compliance with other plans, to the extent they address land and marine uses and development patterns, is set forth below.

### ***Long Island Sound Study Comprehensive Conservation and Management Plan ("LISS Plan")***

The EPA and the states of New York and Connecticut formed the Long Island Sound Study ("LISS") in 1985 in response to concerns regarding the health of the Sound's ecosystem. In 1994, the LISS completed a Comprehensive Conservation and Management Plan ("LISS Plan") that identified certain issues requiring special attention, including land use and development. The Broadwater Project is consistent with the LISS Plan because Broadwater's proposed onshore facilities and the FSRU are water-dependent uses that, among other things, will not adversely affect water quality throughout the watershed. (LISS Plan at 8-9; 125-134). Additional discussion regarding Broadwater's conformance with the goals and targets of the LISS Plan is set forth in Broadwater's response to LIS CMP Policy 5.

### ***Long Island North Shore Heritage Area Management Plan***

The Long Island North Shore Heritage Area Management Plan was developed to provide the communities in the north shore region of Long Island with the tools needed to preserve and celebrate the cultural, historic, and natural heritage of the north shore. (The Long Island North Shore Heritage Area is generally described as the north shore from the Long Island Expressway or State Route 25 (whichever is farther south) to the Connecticut line in Nassau and Suffolk counties.) The plan, which addresses the New York State Heritage Areas System goals of cultural resource management for regional economic revitalization, highlights: (1) identification and preservation of natural and historic places; (2) education about local, regional, and natural history; (3) recreational use of special places; and (4) economic development with public and private investment. The Broadwater Project is consistent with these four goals for the following reasons:

First, the Long Island North Shore Heritage Area Management Plan has the three-part mission of preservation, revitalization and economic expansion, and sustainable heritage development. The goals and objectives of the plan seek to identify potential areas of conflict and mitigate them while providing a framework for enhancing the similarities and the differences of the people of the north shore and their communities. The policies and actions are the primary implementation tools of the plan and include preservation, sustainable heritage development, and economic revitalization for the Heritage Area. The proposed floating storage and regasification unit (FSRU) and subsea pipeline will not adversely impact the stated goals of the North Shore Heritage Area Management Plan because the ~~project~~**Project** has been designed to preserve the North Shore heritage and historical resources, protect environmental, natural and maritime resources, and enhance the economic vitality and cultural life within the Heritage Area, which are the primary intentions of the plan.

In addition, the Management Plan calls for strategic planning to protect water (coastlines, beach views, and water access), sites and structures (landmarks, estates, and historic sites), sites of historic maritime activity, and natural areas. The Broadwater Project was sited to avoid impacts on wrecks and other cultural resources to the maximum extent practicable. The Visual Resource Assessment (VRA) for the Broadwater Project evaluates the Project's impact on historic sites or structures, sites of historic maritime activity, and onshore natural areas. The Broadwater Project was also evaluated to determine any potential impacts on coastline resources, including those associated with beach views. While the FSRU will be visible from the shore (including beach areas) on clear days, the facility will be vessel-like in appearance and thus, similar to views of ships that already use the Sound. The distance from shore coupled with the facility design, which minimizes contrast, combine to lessen the overall visual distinction and perceived importance of the Broadwater Project within the context of the regional landscape (waterscape). Because of the FSRU's limited visibility and design and operating characteristics that render it consistent with other commercial/industrial vessels historically and currently present in the Sound, the Broadwater Project is not anticipated to diminish users' enjoyment or "sense" of the Sound.

Moreover, the Broadwater Project is not expected to adversely affect preservation of the cultural, historic, and natural resources of the Sound. Although there will be short-term impacts on marine natural resources during construction of the interconnection pipeline, the Broadwater Project is anticipated to have long-term environmental benefits. By providing a reliable source of clean-burning natural gas to the target markets, the Project will reduce dependence on other fuels (e.g., coal and petroleum). Any corresponding reduction in overall regional emissions would contribute to regional air quality improvements. Thus, the Broadwater Project is consistent with the North Shore Heritage Area Management Plan.

Finally, economic revitalization is a key component of the North Shore Heritage Area Management Plan and calls for: (1) creative land use to protect structures and districts, guidance for new construction; (2) protection and enhancement of existing features; and (3) focused heritage development with increased economic viability. The main focus of these activities are on the already-developed or constructed environment, including downtown areas, maritime communities, and commercial centers; natural environmental features, including access points and open space; and development of focal point or attractions for interpretation and celebration of the Heritage Area. The Broadwater Project was sited in the middle of the widest

part of the Sound to avoid conflicts with these onshore, coastal environments, especially those areas designated as important historic and cultural resource areas. Broadwater's onshore facilities are consistent with and do not conflict with local land use and comprehensive planning initiatives or the objectives for the Heritage Area. Broadwater's onshore facilities may be located within established maritime centers (e.g., Port Jefferson) and will make use of existing structures and facilities. And business support activities at Broadwater's onshore facilities (e.g., personnel transfer, boat dockage and storage of supplies) will be within zoning districts that allow for these types of activities.

***The Broadwater Project is Consistent with the Mixed-Use Nature of the Long Island Sound Coastal Area***

Long Island's character is defined by the "collection of natural, recreational, commercial, ecological, cultural, and aesthetic resources" that make up Long Island's coastal communities and its landscape. (LIS CMP Policy 1, Explanation). In other words, "the mix of historic structures, traditional harbors, residential areas, open spaces, working waterfronts, agricultural land, and tree-shaded country roads that make up the landscape of the Sound communities" all contribute to "a sense of the Sound." (LIS CMP, Ch. 1 at 3 "Charting the Course"). The historic coexistence of these mixed, diverse uses confirms that no single type of use has been or should be elevated to the exclusion of others, and the LIS CMP confirms that this "contrast and interplay of the green and the built environment should be maintained and celebrated as essential components of community character." *Id.* The Broadwater Project is wholly consistent with these objectives and those set forth in LIS CMP Policy 1, for the reasons discussed below.

***The Broadwater Project will be Consistent with Development in Traditional Waterfront Communities***

Traditional waterfront communities are those communities that have historically "contained concentrations of water-dependent businesses; possess a distinctive character; and serve as focal points for commercial, recreational, and cultural activities of the region." (LIS CMP, Definitions). The Broadwater Project's on and offshore facilities, including the technology and design of the LNG terminal and the interconnection pipeline, are consistent with the stated goals for such communities.

The Broadwater Project's onshore, water-dependent business support facilities, which will be required for the mooring of support vessels (i.e., Project tugs) and the transfer of personnel and waterborne materials to and from the FSRU, will be appropriately located in either the Village of Port Jefferson or Greenport.<sup>4</sup> Whether in Port Jefferson or Greenport, Broadwater's onshore, water-dependent support facilities are consistent with the historic and

<sup>4</sup> Greenport's Mayor is openly in favor of the Broadwater Project and has stated his desire that Broadwater select Greenport to house the onshore, water-dependent business support facilities. Mayor Kappell stated, "If [the Broadwater Project] goes through, it's a bonanza for Greenport.... This is a direct hit for our established policy for encouraging a working waterfront." Approximately 3,000 people worked on Greenport's waterfront building Navy ships during World War II, according to Greenport's mayor, David Kappell. ("A Welcome Shore for a Natural Gas Plant?", John Rather, The New York Times, 2/12/06). About the Broadwater Project, Mr. Kappell stated, "This would be back to the future for Greenport." *Id.*

current uses and zoning of these communities, and they will sustain the pattern of development of revitalizing traditional waterfront communities and preserve onshore open space and views, thereby enhancing the character of these coastal communities.

Significantly, no portion of the FSRU or the interconnection pipeline to the IGTS is proposed to be constructed or operated in or adjacent to traditional waterfront communities. During construction of the pipeline and mooring system, Broadwater will require water-dependent property for staging that will enable the transportation of materials and workers out to the LNG terminal and pipeline site. Such staging, however, will take place in existing buildings in appropriately zoned locations. Broadwater would thus be relying on existing, onshore infrastructure that would avoid competition for other open waterfront property. As a result, the Broadwater Project will not place additional pressures on open, waterfront property, which is of high value and limited availability for water-dependent commercial and recreational users. Similarly, operations and maintenance for components of the LNG terminal will primarily take place offshore, supported by water-dependent operations that will be located in existing buildings in traditional waterfront communities.

### ***Broadwater Makes Appropriate Use of its Coastal Location***

In determining the placement of its onshore and offshore facilities, the Broadwater Project takes appropriate advantage of its coastal location. In conformance with established coastal policies, Broadwater proposes to site onshore facilities on the waterfront, using existing infrastructure rather than building facilities at a new location. Additional, ancillary facilities (i.e., office space and warehousing) will be located elsewhere, again, in existing space.

The Broadwater Project also appropriately uses the waters of the Sound for placement of the FSRU (much in the way that the oil platforms in Northville and Northport appropriately use their respective locations in the Sound). Broadwater's FSRU location, 9 miles offshore, (1) eliminates altogether the potential for competing water-dependent uses along the Sound's coastline, (2) avoids safety-related issues that would arise in the context of attempting to site the Project in an onshore location (as acknowledged by the Coast Guard in the WSR that the site selected for the Project has a number of significant safety and security benefits when compared to those in other locations or using other technologies, especially with respect to threat and consequence since it is remote from population centers (see WSR §§ 5.2.2 and 8.2)), (3) facilitates Broadwater's reliance on waterborne transportation to deliver overseas-sourced LNG, (4) minimizes visibility from the Long Island shoreline (*see also* LIS CMP Policy 3, *infra*), (5) is appropriate for the LNG terminal relative to the scale of other features in the Sound, including vessels engaged in commerce, (6) respects the relationship among developed property, open space, and the water, and (7) protects historic and cultural resources within Long Island Sound (*see also* LIS CMP Policy 2, *infra*). This location also minimizes potential conflicts with other water-dependent users of the Sound, including commercial fishermen and recreational users. As noted in the WSR, the proposed location of the FSRU is in the vicinity but outside of established commercial vessel thoroughfares. WSR § 2.2.2.3. The predominance of east-west transits are to the South of the proposed location and the concentration of north-south transits are to the east of the proposed location. Id. In addition, the WSR confirm that the highest density of recreational boating is generally within 2.3 to 3.5 miles of the shore on both coasts of Long Island Sound and

**that most marine events are held close to shore. WSR § 3.1.2.3.** To the extent that such use conflicts could not be avoided, Broadwater is taking the steps necessary to minimize them.<sup>5</sup> A more detailed analysis of potential marine conflicts is contained in Broadwater's response to LIS CMP Policy 9 and in Appendix E.

***Broadwater will be Protective of Stable Residential Areas***

The Broadwater Project is also important to the protection of Long Island's stable residential areas. As a result of its location in Suffolk County, the Broadwater Project will provide substantial increases to the tax base of Suffolk County, thereby diminishing the tax burden of Long Island residents. Broadwater's total investment is estimated at nearly \$1 billion, and annual operational spending for the LNG terminal is estimated to generate \$3.1 million in state and local tax receipts for Suffolk County. If approved, the Broadwater Project will generate 923 short-term regional construction and related jobs and 30-60 permanent jobs in the local economy for skilled workers. In 2010, \$5.9 million in tax receipts is estimated to accrue to state and local governments in Suffolk County from construction contracts, while \$6 million in state and local tax receipts will be generated from multiplier impacts. The anticipated tax revenues and the resulting primary and secondary economic benefits that will result from the construction and operation of the Broadwater Project will make available additional funds to enhance coastal communities' character and infrastructure.

The Broadwater Project will result in other benefits that will protect stable residential communities as well. For example, the introduction of a competitively-priced, reliable supply of natural gas will be a financial benefit to millions of homeowners. It will also allow for continued compatible residential and supporting development in or adjacent to such areas. Additionally, property values are expected to remain unchanged or increase in the presence of the Broadwater Project. Broadwater completed an analysis of the potential effects on real property values resulting from proximity to an LNG facility or other comparable energy infrastructure facility. The purpose of this analysis was to analyze whether location or proximity to an industrial facility has an impact on residential market prices by evaluating the relationship between residential property values and energy facilities with operating histories. Broadwater's analysis was conducted using generally accepted economic, statistical, and market appraisal principles based upon available data. Broadwater's Property Values Impact Study is attached as Appendix M.

The results of Broadwater's Property Values Impact Study establish that average residential real estate values in close proximity to an energy facility are not adversely affected by its presence. And in some cases, the data demonstrates that the property values in close proximity to the facility appreciate faster than those located farther away. While Broadwater was not able to evaluate facilities of a similar nature to the FSRU, data is available for onshore LNG terminals, other petroleum facilities, and a regional onshore nuclear power plant, which would have similar, if not greater, perceived concerns from the local populace. Broadwater

<sup>5</sup> The express language of LIS CMP Policy 1 states among its objectives that the pattern of development should be one that "minimizes adverse effects...." The use of such language confirms the drafters' tacit understanding that all development will result in some impacts. Therefore, although Broadwater is attempting to avoid development-related adverse effects, where such effects are unavoidable, Broadwater is permissibly minimizing any Project-related impacts.

evaluated the effects on property values relative to the following facilities: Millstone Nuclear Power Plant (Waterford, CT); Santa Barbara Offshore Oil and Gas Platforms; LNG facilities in Everett, Massachusetts and Cove Point, Maryland; and the Commander Oil terminal in Long Island Sound. (see generally Appendix M).

***Broadwater is Consistent with the LIS CMP Objectives for Natural Areas, Recreation and Open Space***

The Broadwater Project will also maintain and enhance natural areas, recreation, open space, and agricultural lands, because Broadwater's onshore, water-dependent business support facilities will be located in existing, appropriately zoned buildings. Broadwater will not be competing for open waterfront property, thereby freeing up high-value land for other water-dependent uses. Broadwater's onshore facilities located in existing buildings, will provide economic benefits while avoiding development pressures to Long Island's coastal communities.

As for offshore facilities, construction and operation of the FSRU will result in limited restriction on access to the Sound for other recreational and commercial users. The total area of the Sound is 1,300 square miles (3,370 square km), containing approximately 2.4 tcf (68 billion m<sup>3</sup>) of water. When considered in relation to the total area of the Sound's usable waters, the FSRU's impact will be comparatively small. There are a multitude of locations and areas within the Sound that will remain available for public access and recreation -- without any restrictions whatsoever -- when the Broadwater Project is in operation. And the limited restrictions that will result from the Broadwater Project are consistent with already-existing safety and security restrictions present in other portions of the Sound. As noted in the WSR, several safety and security zones already exist within LIS. WSR § 2.3.2. These include zones surrounding the Naval Submarine Base, New London, CT, General Dynamics Electric Boat Shipyard, Dominion Millstone Nuclear Power Plant and all anchored Coast Guard vessels. Id. Safety and security zones have also been proposed surrounding the Northport and Riverhead Offshore Platforms Id. In addition, the safety/security zone recommended by the Coast Guard for the Broadwater FSRU represents only a very small portion of the total area of Long Island Sound (0.12%). WSR § 8.2.

The stationary FSRU will occupy a portion of open waters but its visibility will be limited by its design and placement 9 miles offshore. (see LIS CMP Policy 3 response). All shoreline receptors will view the proposed Broadwater Project within the "far background distance" zone and, as a result, the FSRU elements will lose detail and become less distinct. Typically, atmospheric perspective (hazing) reduces colors to blue-greys, while surface characteristics (lines and textures) are lost. On clear days, the FSRU and LNG vessels may be a point of visual interest for observers at the closest vantage points along both the New York and Connecticut coastlines. The LNG terminal will decrease in visibility from distant receptors up and down the coast with increased distance over the horizon and the compounding effect of atmospheric perspective. It is anticipated that typical viewers, such as ferry riders, will likely perceive the FSRU as consistent with existing views, which currently encompass other vessels and structures, including Tosco Corporation's Riverhead Terminal Offshore Wharf offshore of Northville, New York, and KeySpan Energy's Northport Power Plant Offshore Fuel Wharf northeast of Northport, New York. Because of its distant offshore location, in a portion of the Sound already used for water-dependent commerce, and the plethora of commerce around it, the FSRU will not result in a loss of value and "sense" of the Sound.

The Broadwater Project will also contribute to the enhancement of community character for the Sound's coastal communities through the creation of a Social Investment Program, which will promote the maintenance and enhancement of natural areas and open space on Long Island, including those used for recreation (LIS CMP Policy 1.4). Broadwater's SIP is discussed in Appendix L.

***Broadwater is Consistent with the LIS CMP Objectives for Land Use, the Environment and the Economy***

Clean fuel, such as natural gas, is needed to enable and promote the infrastructure and development that sustains Long Island's coastal communities, including its schools, hospitals, and businesses. With the Broadwater Project, governmental services and private business alike will be able to rely on a competitively priced, stable supply of natural gas. This, in turn, will allow for a greater degree of certainty in planning and budgeting, which is important to the stability of every economy.

Another benefit of the Broadwater Project will be its ability to provide natural gas in sufficient quantities and with the necessary reliability to repower power generation facilities that currently burn coal and oil. Repowering these facilities with natural gas is likely to result in significant environmental benefits throughout the Long Island Sound coastal region, notably with regard to air emissions. According to Renewable Energy Long Island, Inc. (RELI), repowering has the potential to reduce air pollution emissions from nitrogen oxides, sulfur dioxide, and carbon dioxide by as much as 90%.<sup>6</sup>

There is unlikely to be a proliferation of other LNG or industrial facilities in the Sound if the Broadwater Project receives its necessary authorizations, permits, and approvals and becomes operational. Concerns regarding rampant "industrialization" of the Sound are simply unfounded. As stated above and in the WSR prepared for the Project, the Sound has a long history of commercial and industrial use that, though a smaller proportion of the regional economy, is still today undeniably part of the Sound's mixed-use character. WSR § 2.2.1 (for the years 2003 through 2005, ports within Long Island Sound experience an average of 2,300 commercial vessel arrivals per year. For those years, there was an average of approximately 462 foreign-flagged vessel arrivals annually at port facilities within Long Island Sound located in both Connecticut and on the north shore of Long Island). The Broadwater Project's relatively benign impacts are not inconsistent with this current and historical legacy. WSR § 8.2 (The Project would increase the overall usage of the Sound by commercial vessels by less than 1%).

From a practical perspective, it is also important to note that siting a project in an offshore location is a costly and highly specialized undertaking, one that, from both a construction and operations standpoint, makes sense for only a limited number of projects. This type of project siting and approach would not be widely applicable to the majority of industrial projects that could potentially be proposed in Long Island Sound. In addition, Broadwater's LNG terminal has been strategically sited to meet the demands of a specific regional target

<sup>6</sup> See <http://www.renewableenergylongisland.org/>, "Enviros Demand Repowering of Dirty Power Plants as Part of KeySpan Deal," RELI Press Release, March 8, 2006.

market -- Long Island, New York City, New York City metropolitan, and Southern Connecticut. It is doubtful that additional LNG projects would seek to be located within the Long Island coastal region, since the satisfaction of market demands by Broadwater would significantly reduce or eliminate the need for additional LNG supply within the region, potentially rendering such other projects, if any, uneconomic.

The Broadwater Project is consistent with LIS CMP Policy 1 because it encourages patterns of development in the Long Island Sound coastal area that benefit community character, preserve open space, make efficient use of existing infrastructure, make beneficial use of a coastal location, and minimize the adverse effects of development. In addition, construction and operation of the Broadwater Project will foster a pattern of development that is consistent with the objectives of this policy because it will bring clean, reliable energy to the region. The introduction of a new, stable, and competitively priced supply of natural gas is fundamental to maintaining existing infrastructure and business and attracting new business consistent with the patterns of development and community character that have historically defined Long Island Sound. Simply put, the pattern of development in the Long Island Sound coastal area reflects the balanced use of the Sound's natural resources to support commerce. See State CMP Final Environmental Impact Statement (FEIS), II-2-4 & II-2-5. Broadwater is consistent with and will foster the continuation of that pattern of development, which recognizes the need for and the desirability of multiple uses within the Sound to fully realize the benefits of one of the State's most abundant natural resources, i.e., the "vast expanses of water surrounding Long Island." *Id.* at II-2-5.

**POLICY 2:** *Preserve historic resources of the Long Island Sound coastal area.*

- 2.1 *Maximize preservation and retention of historic resources.*
- 2.2 *Protect and preserve archaeological resources.*
- 2.3 *Protect and enhance resources that are significant to the coastal culture of the Long Island Sound.*

The Broadwater Project is consistent with and furthers the objectives of this policy, largely through the protection and preservation of existing historic, archaeological, and cultural resources within the Long Island Sound coastal area, and on Long Island.

#### *Offshore Location*

By siting the FSRU 9 miles offshore and using existing onshore sites already used and zoned for commercial purposes, the Broadwater Project is designed to preserve the historic resources of the Long Island Sound coastal area. Recognizing the importance of the coastal culture of the Long Island Sound region, which includes archaeological sites and historic structures that reflect the Sound's diverse heritage, Broadwater completed an extensive survey of Long Island's historic, archaeological, and cultural resources to determine potential impacts, if any, that may result from the Project. In addition to confirming the location of previously identified resources, these cultural surveys identified previously unknown resources within the Sound, thereby confirming the thoroughness of the surveys, and furthering the understanding of the historic context of the Sound.



Broadwater's archaeological surveys of the Project area establish that cultural resources will not be affected as a result of the construction and operation of the Project. Although 9 subsea features in the proximity of proposed pipeline were identified as having the potential to be National Register of Historic Places (NRHP) eligible, these sites can be avoided, protected, and preserved through the use of mid-line anchor buoys. No significant features were identified within the area immediately proximate to the FSRU. As such, construction and operation of the FSRU will not restrict potential future access to any potentially significant cultural sites.

Based on available information from the National Oceanic Atmospheric Administration (NOAA) Automated Wreck and Obstruction Information System (AWOIS), several wrecks appear to be located in the general Project area, the majority of which are in the vicinity of Stratford Shoal. Broadwater also completed a survey that included bathymetry, side-scan sonar, and magnetometer studies in March and April 2005 to develop a route for the proposed subsea pipeline. An archaeological review of the survey results revealed multiple potential wrecks and unknown marine obstructions in the study area. Consequently, the subsea pipeline route was revised to avoid these potential wrecks and any other unknown marine obstructions. The proposed pipeline route is a minimum of 500 feet (152 m) from all potential wrecks and unknown marine obstructions; therefore the proposed subsea pipeline will be consistent with the policy.

~~In addition,~~ Broadwater completed a safety and reliability assessment to address scenarios that could have potential for impacts on historical and archaeological resources (*see* Resource Report No. 11, Safety and Reliability). For example, potential hazards of LNG that could impact historic and archaeological resources include pool fires, flammable vapor clouds, and rapid-phase transition.— Broadwater is designed to prevent such events and it is prepared to successfully address incidents, if any, to provide maximum protection to the Sound's residents and users, the natural resources of the Sound, and its historic, archaeological and cultural resources should such an event occur. Protection of historic and archaeological resources would be achieved through the implementation of a plan that includes a multiple level safety plan that will prevent problems from escalating beyond the immediate area, including radar and positioning systems to alert crew to traffic and other hazards around the vessel; primary and secondary barriers on storage tanks to prevent leakage or rupture; leak detection and mitigation through continual monitoring and emergency shutdown procedures; fire prevention procedures; and establishment of a safety zone that extends beyond the FSRU and LNG carriers. ~~The actual operational safety zone will be determined by U.S. Coast Guard.~~ **In addition, the Coast Guard completed a comprehensive safety and security assessment of the Project as part of the WSR. Based upon this assessment, the Coast Guard has determined that the waters of Block Island Sound and Long Island Sound are suitable for LNG vessel traffic and the operation of the Project provided that measures are implemented to responsibly manage the safety and security risks associated with the Project. WSR § 8.3. These strategies include several mitigation measures, including the Coast Guard's establishment of safety/security zones around the Broadwater FSRU and the LNG carriers transiting the Sound. WSR § 8.4.**

In addition, an emergency response plan will be in place to address potential hazards and disasters. **This plan will be consistent with those recommendations made in the**

**WSR.** These measures taken together will limit any potential impact on archaeological resources in the vicinity of the proposed FSRU and subsea pipeline. It should be noted that LNG carriers possess an outstanding safety record and have been operating without significant incident internationally for over 40 years.

Last, since the time that Broadwater initiated its survey regarding the potential existence of historic and/or cultural resources within the vicinity of the Project site, Broadwater has maintained close coordination with State Historic Preservation Office (SHPO). Results of the cultural/geophysical surveys were submitted to SHPO for review and Broadwater has largely resolved outstanding concerns and issues raised by SHPO (*see* Resource Report No. 4, Cultural Resources). SHPO has confirmed that it is satisfied with Broadwater's survey and analysis and has not requested any additional surveys.

### *Onshore Location*

With the identification of the two potential onshore locations at Port Jefferson and Greenport, Broadwater reinitiated contact with SHPO to assess the cultural sensitivity of these two sites. Based on the significant urban development at both sites, SHPO has concurred that intact prehistoric archaeological resources are not likely to occur at either site. With respect to the historic resources, NHRP-listed sites exist in proximity to both sites. If the Greenport site is selected, SHPO has recommended that Broadwater submit design documents to the SHPO for review due to the presence of two National Register listed historic districts adjacent to the site (Greenport Village Historic District and Greenport Railroad Complex). SHPO also indicated that the proposed site may contain potentially National Register eligible buildings. Broadwater is committed to working with SHPO as this Project moves forward to ensure that any proposed facilities are consistent with the existing historic resources in Greenport and that any identified historic and archaeological resources at proposed waterfront facilities at Greenport are fully protected and preserve the Sound's diverse cultural heritage.

For all these reasons, the proposed subsea pipeline route, the FSRU, the LNG carriers transiting the Sound and the two potential onshore locations will be consistent with this policy.

**POLICY 3:** *Enhance visual quality and protect scenic resources throughout Long Island Sound.*

- 3.1 *Protect and improve visual quality throughout the coastal area.*
- 3.2 *Protect aesthetic values associated with recognized areas of high scenic quality.*

The Broadwater Project is consistent with and furthers the objectives of this policy, as the distant, 9-mile offshore location prevents impairment of and protects components that contribute to Long Island Sound's high scenic quality. The Broadwater Project recognizes the significant contribution of visual quality to the character of the Sound, including the importance that "cultural elements in the landscape and the interplay of the built and natural environments" play in creating that visual quality. (LIS CMP Policy 3) The Broadwater Project has been designed and located to minimize the introduction of discordant features into the coastal area. Broadwater's VRA (which was prepared in support of its recently-submitted FERC

application), provides a qualitative and quantitative assessment, including comprehensive inventory of the scenic resources and potentially sensitive receptors within the vicinity of the Broadwater FSRU. A copy of the VRA is annexed hereto as Appendix K.

The FSRU has been located near the center of the Sound at its widest point in part to maximize the distance from any coastal vantage point and minimize potential visual impact on coastal resources. At its proposed location 9 miles off the coast, there is no location in the Sound where the Project would be substantially farther from the nearest coastal observer. And because of its distant offshore location, in most cases the LNG terminal is not visible from urban areas or historic maritime communities and will not adversely affect dynamic scenic elements of the coastal area. The inventory of potentially sensitive receptors that was prepared as part of Broadwater's VRA confirms the limited number of potentially sensitive locations from which the FSRU will be visible. Appendix K at 40.

There are many locations from which the Broadwater Project will not be visible at all or will be only minimally visible, due to its siting location, design, and coloring, and further depending upon weather conditions, daylight available, and haze. A detailed discussion of factors contributing to potential visibility of the Broadwater Project is set forth in section 3.0 of the VRA. See Appendix K. From the locations from which it is visible, the Broadwater Project will appear similar in visual character to an ocean going vessel on the distant horizon. **Numerous large vessels operate routinely on Long Island Sound, including deep draft vessels exceeding 800 feet in length which generally carry liquid petroleum products or coal. Generally foreign flagged commercial vessels calling at LIS ports range in length from 500 to 902 feet. WSR § 2.2.1.1.** Broadwater's LNG terminal is designed as a single unified and consolidated grouping of elements. By necessity, no space is wasted, and as a result, the Broadwater Project preserves space on the open waters of the Sound and provides visual organization of its water-based facilities. Many land based-observers may find the FSRU and LNG carriers traveling to/from the FSRU to be points of visual interest or at least a common, recognizable, and accepted feature of the Sound. Therefore, the Broadwater Project is consistent with the stated objectives of this policy, which calls for the recognition of water-dependent uses as important additions to the visual interest of the Sound's coast.

The Broadwater Project is also consistent with this policy because it protects scenic values that are associated with public lands, including public trust lands and waters, and natural resources. There are no scenic areas of statewide significance within the Broadwater Project viewshed. The Broadwater Project will also not be at all visible from the Nissequogue River, one of the natural resources of greatest concern for preservation under the LIS CMP. *Id.* In addition, because the FSRU resembles a ship similar to those already transiting the Sound, it is unlikely to affect viewers' perception or "sense" of and values associated with the Sound. The distance from shore coupled with the facility design (which minimizes contrast) combine to lessen the overall visual distinction of the Project within the context of the regional landscape (waterscape). When visible, the proposed facility will generally appear as a small two-dimensional rectilinear form on the horizon from distant coastal vantage points. And while the outline of the FSRU will break the visible horizon from distant coastal vantage points, it will appear quite low and as distance increases will be difficult to distinguish on the horizon. As a result, it will not be a dominant feature in the viewscape.

Because of the FSRU's limited visibility and design and operating characteristics that render it generally consistent with other commercial/industrial vessels historically and currently present in the Sound, the Broadwater Project is not anticipated to diminish users' enjoyment or "sense" of and values associated with the Sound. A person's "sense" of and values associated with the Sound are presumptively predicated on the range of values that people ascribe to Long Island Sound's natural resources, including the scenic values of public lands. Such values are inherently reflective of and predicated upon their perception of the multitude of mixed uses that have historically existed and remain within the Sound today. On a continuum, there are users of the Sound who believe that the quality of the Sound's resources can only be enjoyed if maintained in their most natural state and those who appreciate the need for and desirability of a balance between commercial/industrial growth and the preservation of the Sound's coastal resources. Those on the latter end of the continuum recognize that the mixed uses within the Sound (i.e., recreation, commercial fishing, and industry/commerce, among others) are important factors that, when combined, make up the "sense of the Sound." The Broadwater Project will be protective of the "sense" of and values associated with the Sound as a result of its design and location, as well as the environmental benefits (e.g., improvement in air quality and related visibility) that will likely result with the use of natural gas and the repowering of existing power generation facilities.

Significantly, the proposed offshore location avoids the need to construct a new or expanded industrial port, gas storage tanks, re-gasification facilities and shoreline crossings to connect to the IGTS pipelines on Long Island's coast. Such land-based facilities to support an LNG terminal could be considered discordant and disruptive to the scenic quality of Long Island's coastline. In this manner, the proposed Project completely avoids introducing discordant features within the coastal area and preserves the scenic quality of the coastline. Additionally, the offshore Project location does not require removal of any existing shoreline vegetation, which would likely be required with the development of an on-shore terminal.

Broadwater's onshore facilities will be located at existing, commercial buildings. This use of existing buildings is consistent with and furthers the objectives of this policy by avoiding the introduction of discordant structural features on the landscape. These onshore facilities will provide support operations for the LNG terminal and FSRU, the primary purpose being the transfer of people, supplies, and FSRU support vessels to and from the Project area 9 miles off the coast. These water-dependent uses to support Broadwater's business are consistent with this policy, which, as noted above, recognizes the desirability of "water-dependent uses as important additions to the visual interest of the Sound's coast."

In addition to Broadwater's efforts to maintain the visual quality of the Sound and its coastline through location, configuration, and design, the Broadwater Project also presents the opportunity for aesthetic offset mitigation. Such aesthetic offsets might include, among other things, removal of non-project related eyesores within the coastal area, or participation in the Long Island Sound floatables clean-up program.<sup>7</sup> The floatables program is an organized initiative to remove debris that commonly washes ashore on Sound beaches. Broadwater's investment in such a program could provide a significant improvement in the visual quality of the public coastline.

<sup>7</sup> See <http://www.longislandsoundstudy.net/pubs/facts/fact8.pdf>.

Both the on and off shore facilities of the Broadwater Project are protective of the visual quality of the Sound and its recognized scenic resources. For these reasons, and those more fully addressed in Broadwater's VRA, the Broadwater Project is consistent with this policy.

**POLICY 4:** Minimize loss of life, structures, and natural resources from flooding and erosion.

- 4.1 *Minimize losses of human life and structures from flooding and erosion hazards.*
- 4.2 *Preserve and restore natural protective features.*
- 4.3 *Protect public lands and public trust lands and use of these lands when undertaking all erosion or flood control projects.*
- 4.4 *Manage navigation infrastructure to limit adverse impacts on coastal processes.*
- 4.5 *Ensure that expenditure of public funds for flooding and erosion control projects results in a public benefit.*
- 4.6 *Consider sea level rise when siting and designing projects involving substantial public expenditures.*

The Broadwater Project is consistent with and furthers the objectives of this policy through the preservation of existing near shore resources that provide protection from flooding and erosion. No aspect of the Project will have an impact that results in the increased likelihood of loss of life, structures and natural resources from flooding and erosion. There are no onshore structures that could result in measurable increases in erosion, flooding, or development that will be sited as part of this Project, as Broadwater proposes to use onshore facilities that take advantage of existing infrastructure within currently operable harbor areas. By using existing facilities, Broadwater is able to avoid digging and/or moving soils and clearing vegetation that are typically part of land development and construction. Broadwater's use of operable harbors also eliminates the need for new dredging or creation of additional navigation channels within the harbors of Long Island Sound. In addition, Broadwater does not propose construction or reconstruction of erosion protection structures. There will be no storage of materials that could generate an explosion that could result in loss of life, structures, or natural resources due to the unlikely result of flooding or erosion. As such, there will be no threats to life, structures or natural resources from flooding and erosion as part of the Project.

Broadwater's offshore facilities will also not result in hazards or threats to human and marine life, structures, and natural resources from flooding and erosion due in large part to its distant location in the central portion of the Sound. In the highly unlikely event of an incident on the FSRU, impacts that could occur include pool fires and vapor clouds that would be restricted to the central portion of the Sound. Since LNG is less dense than the Sound water, impacts would be restricted to the water's surface and the atmosphere directly above; **according to the WSR, the principal characteristic of the consequence of a large release of LNG due to an accident or an attack is fire, not an explosion. WSR §§ 1.4.1, 8.2.** Thus, there would be no physical disruption of significance that could increase flooding or erosion in coastal areas within the Sound.

Construction of the proposed pipeline will involve installation of the pipeline below the seafloor, which will require trenching in coastal waters. The pipeline will be installed to an appropriate depth or covered with rock or concrete mattresses to ensure integrity. The construction phase will not interfere in any way with natural coastal processes. Trenching will create a temporary and minimal disturbance of sediments, but nearshore areas will not be impacted. Modeling of the sediment generated from installation (*see* Resource Report No. 2, Water Use and Quality) demonstrates that nearshore areas will not be impacted by construction-related sedimentation.

The Project will also not result in interference with natural coastal processes that supply beach materials to land adjacent to such waters. Additionally, the Broadwater Project will not have any impact on coastal processes that could result in flooding and/or erosion and will safely accommodate the most severe weather data that can credibly occur in the area, including hurricanes. By siting in the central portion of the Sound, Broadwater avoids the need to require dredging or construction of other coastal structures that could affect the normal processes of the Sound, thereby resulting in increased flooding or erosion. Simply put, all natural coastline features that contribute to the Sound's protection will be preserved as a result of this privately funded Project.

For all of these reasons, the Broadwater project will be consistent with this policy.

**POLICY 5:** *Protect and improve water quality and supply in the Long Island Sound coastal area.*

- 5.1 *Prohibit direct or indirect discharges which would cause or contribute to contravention of water quality standards.*
- 5.2 *Manage land use activities and use best management practices to minimize nonpoint pollution of coastal waters.*
- 5.3 *Protect and enhance the use of coastal waters.*
- 5.4 *Limit the potential for adverse impacts of watershed development on water quality and quantity.*
- 5.5 *Protect and conserve the quality and quantity of potable water.*

The Broadwater Project is consistent with and furthers the objectives of this policy through specific design and operations to protect water quality in the Long Island Sound coastal area. Any and all discharges (both direct and indirect) to the Sound will comply with applicable standards, thus avoiding the potential for discharges to cause or contribute to contravention of water quality standards. The Broadwater Project will "not materially adversely affect receiving water quality." (LIS CMP at 78).

#### ***Broadwater is Protective of the Sound's Water Quality***

Broadwater completed a comprehensive literature review and field survey regarding Long Island Sound baseline conditions. The results of that baseline study are set forth in Broadwater's Environmental Sampling Report. (*see* Resource Report No. 2, Water Use and Quality). Broadwater's detailed water quality modeling demonstrates that construction will result in only minor, short term impacts to water quality. These short term impacts are not

anticipated to substantially affect the overall water quality and supply in the Sound, or result in long term impacts to the water quality of the Sound as a result of the operation of the Project, including the LNG terminal, FSRU, LNG carriers transporting LNG to the Project.

Broadwater does not anticipate significant long-term Project-related impacts on water quality in Long Island Sound, and has taken a proactive approach to protecting Sound water resources both through design and long term operation of the Project. For example, high water usage is a common practice that may impact water quality at conventional LNG regasification facilities. However, for the initial design phase of the Project, Broadwater selected shell and tube vaporization (STV) to regasify the LNG. The STV design is a closed-loop system with minimal intake and discharge of large volumes of water. Broadwater has purposely selected a vaporization technology that greatly eliminates the need for intake and discharge of large volumes of water and which will not result in substantial temperature changes in Sound waters. In this manner and consistent with this Policy, the Broadwater Project preserves the Sound's water resources. As presented in Appendix A, Broadwater has examined all aspects of the operational phase of the FSRU to assure that anticipated discharges (both point and nonpoint) are protective of the existing water quality standards and will not result in any contravention of those standards.

The FSRU will be operated to minimize the occurrence of any fuel spills and non-point discharge of excess nutrients, organics, and eroded soils into coastal waters. This will be accomplished through adherence to an Spill Prevention Control and Countermeasure (SPCC) Plan, which will be implemented during construction and operation of the Project.

There are no anticipated long-term pollution impacts to the waters of the Long Island Sound or to the aquifers that provide the drinking water supply to the Long Island Sound region. Similarly, the Broadwater Project will not impact the quantity of potable water within the region. The water quality systems on board the FSRU have been designed to meet or exceed New York State Department of Environmental Conservation (NYSDEC) water quality criteria for physical as well as chemical parameters. All outfalls from the FSRU will be appropriately permitted through the NYSDEC to assure compliance with all applicable water quality standards. Broadwater has committed to using Membrane Bioreactor ("MBR") technology to treat all generated black and grey water. Furthermore, if through consultation with the NYSDEC it is determined that MBR discharge could not meet the Long Island Sound water quality (WQ) standards, all generated black and grey water would be containerized and shipped to shore for disposal at an approved treatment facility. In addition, effluent discharge is minimized and carefully controlled through design and best management practices (BMPs) and all point source discharges will be permitted through NYSDEC to assure adherence to applicable state water quality discharge requirements.

The Broadwater Project will result in the discharge of non-point source stormwater to the Sound; however, only uncontaminated stormwater will be allowed to drain freely overboard. The Broadwater design incorporates control structures to isolate deck areas that could be subject to minute quantities of soil and grease. Stormwater from these deck areas will be routed to the bilge tanks for appropriate disposal onshore.

Installation of a subsea pipeline also has the potential to impact water quality via resuspension and transport of sediments within Long Island Sound. Broadwater has conducted

modeling to assess the potential dispersion of sediment resulting from construction. As demonstrated by this modeling, construction will result in only temporary increases in suspended sediment, primarily in the bottom of the water column, and visible at the surface. (see Appendix A and E, including sub-appendix A, to Resource Report No. 2, Water Use and Quality). Normal tidal fluctuations in the Sound help dissipate the suspended sediments, with the isolated spikes in total suspended solids dissipated within 24 hours. Water quality impacts associated with resuspension could occur from disturbance of contaminated sediments during pipeline installation. Analysis of the water and sediment samples taken along the extent of the Project area indicate that no significant contamination exists within the Project area.

Broadwater anticipates using water from Long Island Sound for hydrostatic testing of the subsea interconnection pipeline that will connect the FSRU to the Iroquois Gas Transmission System (IGTS) pipeline. Once hydrostatic testing is successfully completed, a drying agent will be used to dry the pipeline. The drying agent will not be discharged from the pipeline to the environment; it will be recovered and returned to the vessel for recycling or disposal.

As the proposed Project is located entirely within Long Island Sound, no known groundwater or wetland resources will be affected by installation or operation of the Project. In addition, siting the FSRU in the deeper central waters of the Sound avoids the need for inshore dredging and disposal. For onshore facilities that have been identified for use as warehousing, office and general support facilities, Broadwater will minimize the occurrence of any spills and non-point discharge of excess nutrients, organics, and eroded soils into coastal waters. This will be accomplished through adherence to an SPCC, which will be implemented during construction and operation of the Project. Additionally, Broadwater will have no impact on the quantity of any potable water supplies in the vicinity of the onshore facilities at Port Jefferson or Greenport and as such will protect and conserve potable water sources.

***Broadwater is Consistent with the Water Quality Objectives of the Long Island Sound Study Comprehensive Conservation and Management Plan***

Broadwater has also considered the goals and objectives of the LISS Plan and will be fully consistent with the recommendations and targets established therein. A discussion of the LISS Plan and the Broadwater Project's consistency with it is set forth below.

The LISS Plan identifies six issues requiring special attention: (1) low dissolved oxygen levels (hypoxia), (2) toxic contamination, (3) pathogen contamination, (4) floatable debris, (5) living resources and habitat, and (6) land use and development. The plan describes ongoing programs and LISS's commitments and recommendations for actions that specifically address the Sound's priority problems. In 2003, the EPA and the states of New York and Connecticut signed the Long Island Sound Agreement, which builds on the goals of the 1994 LISS Plan by adding 30 new goals and targets to restore Long Island Sound. As discussed below, the placement of an FSRU and associated subsea pipeline in the Sound would not conflict with any management objective being implemented or the 30 specific goals implemented by the LISS Plan. Broadwater designed the Project to minimize impacts to the extent practicable and to ensure that the Sound continues to function as a resource of regional significance.



- Hypoxia. The discharge of excessive amounts of nitrogen is the primary cause of hypoxia in Long Island Sound. This impact is a primary concern in the western portion of the Sound and in some central portions during the warmer summer months. The concern is highest for waters close to areas with high population densities, where the associated discharges to the Sound (e.g., sewer overflows) often contain elevated levels of contaminants that increase the biological oxygen demand (BOD) in the Sound's waters. Oxygen levels in the Sound also can be affected by runoff from agricultural areas, which may contain excess fertilizers. Broadwater designed the FSRU to minimize wastewater discharge to the Sound, and all discharges will be in accordance with applicable water quality regulations. Waste water generated on the FSRU will be treated prior to being discharged and will not have a BOD greater than 50 milligrams/liter (mg/L). If water quality discharge standards cannot be achieved, Broadwater will ship wastewater to shore for disposal at an approved facility. Based on the results of the spring 2005 field sampling, no significant BOD was identified in the Project area. Therefore, any potentially elevated BOD levels associated with FSRU discharges would be readily assimilated by the Sound. In addition, since all discharges from the FSRU would occur near the surface, any discharges from the FSRU would not cumulatively impact hypoxic conditions, which are concentrated at or near the bottom in deeper water.
- Toxic Contamination. The primary sources of toxic substances entering the Sound are industrial complexes along the major tributaries of the Sound (i.e., the Connecticut, Housatonic, Quinnipiac, and Thames Rivers), sewage treatment facilities, and urban runoff. The location of the FSRU in the central portion of the Sound is unrelated to specific impacts resulting from onshore point-source contamination. Broadwater has analyzed the existing water quality and sediment quality conditions within the Project area, based on the spring 2005 field surveys. Based on Broadwater's sampling results, no action levels for any contaminants of concern are exceeded in the Project area. (See Appendix A and Resource Report No. 2, Water Use and Quality).
  - Implementation of storm water management controls and spill prevention and countermeasure procedures will minimize the potential release of fuels and other lubricants into the water column. As part of the Project, a site-specific SPCC Plan for all Project-related activities will be developed.
  - To the extent that accidental discharge of LNG to the Sound has been identified as a potential concern, any LNG accidentally discharged to the Sound would float on the surface and completely evaporate, leaving no residue and eliminating potential contamination of marine resources. Therefore, even in the unlikely event of an incident resulting in an LNG discharge, such incidents would not pose the potential human health and environmental

threats generally recognized and associated with petroleum spills. While there will be air emissions associated with operation of the FSRU, all facility emissions will be in accordance with state and federal regulations and will be subject to review by NYSDEC and the U.S. Environmental Protection Agency (EPA).

- **Pathogen Contamination.** Pathogens enter Long Island Sound from untreated or inadequately treated human sewage and wild and domestic animal waste. Vessel sewage discharge has been identified as one of four pathogen sources warranting primary management actions. As part of the 2003 Agreement, efforts are being made to designate all Sound embayments in New York as vessel no-discharge areas. This and other pathogen-release management actions focus on nearshore areas, where the introduction of pathogens has the greatest potential to adversely affect aquatic life and public health. Based on its offshore location, operation of the FSRU will have no effect on current or planned pathogen management activities. The FSRU design incorporates appropriate treatment of waste prior to discharge, and all discharges will be in accordance with applicable water quality regulations. If water quality discharge standards cannot be achieved, Broadwater will ship wastewater to shore for disposal at an approved facility. In addition, all vessels berthing at the LNG terminal will be required to comply with the requirements of MARPOL (International Convention on the Prevention of Pollution from Ships). No waste will be discharged from the LNG carriers within Long Island Sound.
- **Floatable Debris.** All waste generated at the FSRU will be properly disposed of in accordance with state and federal permit regulations, and no unauthorized release of floatable debris into the Sound will occur. With regard to waste handling, the same practices as developed for offshore oil production facilities will be incorporated into the Broadwater waste management plan.
- **Living Resources and Habitat.** Besides water pollution, destruction and degradation of habitat and over-harvesting from fishing are identified as the primary threats to living resources and habitats in Long Island Sound. Management activities to preserve and enhance living resources focus on nearshore areas and include protection and restoration of tidal wetlands, intertidal sand and mud flats, and submerged aquatic vegetation. Broadwater sited the FSRU and interconnecting pipeline in the central portion of the Sound to avoid impacts on critical inshore resources. While impacts will occur in the central portion of the Sound from installation of the Project, no inshore coastal habitats will be impacted.

Installation of the pipeline and FSRU mooring structure will result in both positive and negative impacts on the existing resources of Long Island Sound. Installation of the mooring structure will affect approximately 13,180 square feet (1,225 m<sup>2</sup>) of seafloor. This impacted area is relatively insignificant in terms of the overall substrate available in the Sound.

Moreover, following installation, the mooring tower will actually increase habitat diversity by providing vertical structure, which is currently absent from the central portion of the Sound, and does not offer any unique or high quality habitat. Construction of the Project will result in the short-term displacement of the bottom habitat as the pipeline is installed below the seafloor; however, native communities will be allowed to reestablish following completion of construction. Scheduling installation during the winter months will further reduce impacts by largely avoiding breeding activities and by avoiding the summer season, when a greater number of migratory populations utilize the Sound. Additional discussion of potential impacts on living marine resources is set forth in Appendix B.

As demonstrated above, Broadwater will take all necessary steps to ensure the maintenance of the water quality of the Long Island Sound. For these and all the other foregoing reasons, the Broadwater Project will be consistent with this policy.

**POLICY 6:** *Protect and restore the quality and function of the Long Island Sound ecosystem.*

- 6.1 *Protect and restore ecological quality throughout Long Island Sound.*
- 6.2 *Protect and restore Significant Coastal Fish and Wildlife Habitats.*
- 6.3 *Protect and restore tidal and freshwater wetlands.*
- 6.4 *Protect vulnerable fish, wildlife, and plant species, and rare ecological communities.*
- 6.5 *Protect natural resources and associated values in identified regionally important natural areas.*

The quality and function of the Long Island Sound ecosystem depends on both physical and biological components, including geology, soils, water, marine habitats, and marine species. The Broadwater Project is consistent with this policy, protecting the quality and function of the Long Island Sound ecosystem. Appendix B provides a discussion of both the existing resources within the Sound, and the anticipated short term and manageable impacts resulting from implementation of the Broadwater Project.

The FSRU's proposed offshore location and design are protective of Long Island Sound's environmental and biological components, largely preserving and protecting the ecological quality of Long Island Sound. Broadwater's use of existing onshore facilities is similarly protective of the environmental components of Long Island Sound, by avoiding additional, new development on Long Island's coast. The benefits of Broadwater's preferred alternative upon the Long Island Sound ecosystem, and the explanation of the Project's conformance with this policy are set forth below.

Long Island Sound's biological marine ecosystems are dependent on the water and underlying sediments for food, shelter, and breeding habitats. In order to preserve the Sound's water quality, Broadwater is proposing to use an FSRU with STV design. The STV design is a closed-loop system that avoids the need for large volumes of water required by other LNG technologies, such as Open Rack Vaporization (ORV).

By siting well offshore, Broadwater avoids the critical inshore coastal areas recognized for their value in providing the greatest biological diversity in the Sound. Broadwater avoids critical spawning and nursery grounds concentrated in shallower in-shore waters. The proposed Project is located in deep water near the center of Long Island Sound, away from shallow nearshore areas designated by NYSDOS as Significant Coastal Fish and Wildlife Habitat (SCFWH). The largely homogeneous substrate in the central portion of the Sound provides no unique habitats for Long Island Sound species. All inshore SCFWHs are avoided. The only SCFWH traversed by the Project is the Race, which would be affected only by LNG carrier traffic. This traffic is consistent with the current commercial/industrial traffic ~~that~~**which** also traverses the Race and would not result in any direct impact to the resource. **This is similarly described in the WSR. The passage between Race rock light and Valiant rock is the route through the Race that would be utilized by LNG carriers. This is a mixed use area consisting of commercial deep draft tug and barge traffic, commercial ferries, charter fishing boats and recreational vessels. WSR § 3.2.5.2.1.** The U.S. Fish and Wildlife Service (USFWS)- and Long Island Sound-designated significant habitats are also largely restricted to

near shore and coastal areas and therefore are not impacted by the Project. The Broadwater Project is consistent with this policy because there are no freshwater wetlands or National Wetlands Inventory (NWI) wetlands within or adjacent to the proposed locations for onshore facilities. See Broadwater's Onshore Facilities Resource Reports, section 3.1 at 3-1 and 3-8, annexed as Appendix O. Due to the location of the FSRU and interconnection pipeline offshore, these facilities will also not impact any wetlands.

Use of Sound water will result in impingement and entrainment of Long Island Sound planktonic organisms. Broadwater evaluated existing ichthyoplankton data collected as part of the Poletti Power Project, and has undertaken an additional ichthyoplankton sampling at the proposed FSRU location. Results of these analyses demonstrate that the ichthyoplankton impacts resulting from the Project will not have a material negative effect on existing vulnerable communities within the Sound. Construction of the offshore pipeline will mainly result in short-term impacts on marine habitats and all disturbed areas are expected to return to preconstruction conditions following completion of construction. See Broadwater's response to LIS CMP Policies 5 and 11; see also Appendix B, section 1.2. Marine species that may be impacted by construction of the Project are those associated with benthic habitats, including demersal finfish, shellfish, early benthic-phase lobsters, and benthic communities. Broadwater expects these impacts to be short term and minor since benthos recolonization is expected to occur within months of construction completion, and bottom habitat will return to preconstruction conditions. Several threatened and endangered mammal, fish, and reptile species are known to occur in the Project area. Impacts on these species are anticipated to be minimal.

Impacts on Essential Fish Habitat (EFH) during construction of the pipeline route and FSRU could result from increases in turbidity levels and suspended solids and temporary disturbance of bottom habitat. Because natural sedimentation and benthic recolonization is expected to occur within months immediately following construction activities, disturbance to EFH is anticipated to be short term and minor, and healthy, fully functioning ecosystems would be expected to reestablish following the installation of the pipeline.

There is no Endangered Species Act (ESA) designated critical habitat within the Project area. In addition, there are no tidal or freshwater wetlands located in the Project area. Expected safety and security zones surrounding the FSRU and a stationary tower structure will create a protected area free from ongoing fishing pressures, which will likely enhance the ecosystem in immediate proximity to the FSRU. Broadwater does not anticipate encountering bedrock along the pipeline route; therefore, no underwater blasting is proposed. The FSRU will be secured in place in Long Island Sound via a yoke mooring system (YMS), which will be anchored to the seafloor by a tower structure. The tower will have a footprint on the seafloor of the Sound of approximately 7,000 square feet, which represents a small portion of the overall seafloor of the Sound.

The proposed Project will not involve the discharge of untreated contaminants into coastal waters. All wastewater generated at the proposed facility will be diverted through an appropriate treatment system prior to being discharged. All discharges from the facility will be in accordance with state water quality standards. No waste discharged to the Sound will occur from the LNG carriers associated with the Project.

Normal operation of the FSRU will require the use of water for ballasting and daily operations. LNG carriers servicing the facility will also need to use Sound water for cooling water while moored at the facility. Potential operational impacts on marine habitats include the introduction of non-native species by LNG carriers and effects on marine life from ballast water intake. Potential impacts will be minimized to the extent practicable through appropriate FSRU design and mitigation measures, including the following: minimization of water intake velocities to 0.5 ft/s (0.15 m/s), use of 5 mm screening to prevent entrainment of larger organisms, and locating intake structures for the FSRU and LNG carriers in the middle of the water column (approximately 28-40 feet) to avoid high planktonic densities that occur at the surface and on the bottom.

Changing FSRU ballast water prior to arriving in Long Island Sound will reduce the potential for transfer of non-native organisms. During the operational phase, the FSRU placement will be fixed, and therefore the exchange of ballast water should not introduce non-native species. LNG carriers will not discharge ballast water in the Sound but will take in ballast water while unloading LNG to compensate for the decreased weight and to maintain stability. Intake water systems will utilize screens to control the entrainment of debris and fish into the ballast system.

There will be a minimal potential risk of ignition of an LNG carrier while in transit or moored at the FSRU that could potentially cause a threat to Long Island Sound's ecosystems. The LNG carriers will be constructed to meet all U.S. and international standards and, when at port, safety and ~~precautionary~~security zones will be enforced. The Project is being designed with many levels of spill prevention in place to ensure that an LNG spill does not occur. Broadwater completed a safety and reliability assessment to address potential disaster scenarios that could impact coastal resources. Potential hazards evaluated by Broadwater include pool fires, flammable vapor clouds, and rapid-phase transition, in addition to terrorist-related threats to shipments and LNG vessels. In addition, to mitigate potential safety and security risks associated with the project, the USCG proposed, among several other mitigation measures, to promulgate safety/security zones for the FSRU and the LNG carriers. The primary purpose of the safety/security zones is to reduce risks to the public by limiting access to the areas of highest consequence should an LNG fire occur and to provide a security perimeter to protect the FSRU and LNG carriers.

Multiple levels of safety also will be in place to prevent problems from escalating beyond the immediate area, including radar and positioning systems to alert crew to traffic and other hazards around the vessel; primary and secondary barriers on storage tanks to prevent leakage or rupture; leak detection and mitigation through continual monitoring and emergency shutdown procedures; and establishment of a safety zone that extends beyond the FSRU and carriers. The results of Broadwater's safety and reliability assessment are contained in Resource Report No. 11, Safety and Reliability. In addition, an emergency response plan will be in place to address potential hazards and disasters. This plan will be consistent with those recommendations made in the WSR. Similarly, there is no basis for concern that the ignition of Broadwater's onshore facilities could possibly produce significant adverse changes to Long Island Sound's ecosystem, as Broadwater will not store materials capable of producing such result at its on-shore water-dependent facilities. In addition, Broadwater's tugs will be fueled directly from road tankers at the onshore site. There will be no bulk storage of fuel at

Broadwater's onshore locations. (see Onshore Facilities Resource Reports, Appendix O). In the unlikely event of an emergency event on a tug, Broadwater's tug boats will be equipped with fire-fighting equipment.

For all the foregoing reasons, the Broadwater Project will be consistent with this policy.

**POLICY 7:** *Protect and improve air quality in the Long Island Sound coastal area.*

- 7.1 *Control or abate existing and prevent new air pollution.*
- 7.2 *Limit discharges of atmospheric radioactive material to a level that is as low as practicable.*
- 7.3 *Limit sources of atmospheric deposition of pollutants to the Sound, particularly from nitrogen sources.*

The Broadwater Project is consistent with and furthers the objectives of this policy, as the Project will be consistent with all applicable state and federal air quality requirements. The Broadwater Project also brings the opportunity to enhance regional air quality through the introduction of additional, clean-burning natural gas into the region. Cleaner burning natural gas supplied by the Project will be available to replace coal and oil fuels currently serving much of the Region's energy needs. New or existing power generation, residential heating, and environmental/industrial applications will be able to take advantage of the availability of natural gas that is currently in limited supply. The switch to use of natural gas from coal and oil will result in lower emissions resulting in less deposition of acid rain precursors and nitrogen sources, such as oxides of nitrogen (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>), into Long Island Sound. In addition, Broadwater's incorporation of lowest achievable emission rate (LAER) technology and best available control technology (BACT) into the FSRU design (through the use of low-NO<sub>x</sub> burners, selective catalytic reduction, and oxidation catalysts for each process heater and turbine) minimizes emissions of NO<sub>x</sub>, carbon monoxide, and volatile organic compounds from the Project. Broadwater also has evaluated LNG carrier emissions to assist the Federal Energy Regulatory Commission (FERC) in evaluating the Project for compliance with general conformity requirements. Throughout the Project authorization process, Broadwater is coordinating closely with the U.S. Environmental Protection Agency (EPA), NYSDEC, and FERC regarding applicable air permitting and general conformity review requirements and, if applicable, any emission offsets needed to mitigate air emissions from the Broadwater Project.

Construction of the Broadwater Project is expected to have minor, short-term effects on regional air quality as described below. Broadwater's anticipated construction schedule is as follows: (i) pre-construction survey and mobilization -- September and October 2009; (ii) main pipe lay for interconnection pipeline to IGTS -- October 2009 to April 2010; (iii) setting YMS jacket and driving piles -- October - December 2010; and (iv) remaining tie-ins, testing and commissioning -- November - December 2010. During the construction period, air emissions from the construction vessels (lay barges, pipe barges, and supporting vessels) will add to regional emission levels. The ambient effects from these vessels will be minor and temporary, and their effects will be minimized through the use of pollution control equipment and other mitigation measures. In addition, Broadwater intends to complete the majority of construction during non-summer months (i.e., October - April) assuming no weather delays. As a result, associated emissions are not expected to occur during (or contribute to) the summertime ozone season. Construction and emissions (including visible emissions) from the equipment will quickly dissipate, and because most construction-related emissions will occur several miles from shore, the effects on onshore areas will be minimal, if any.



Emissions-generating equipment on the FSRU, including process heaters and generators, will be evaluated under NYSDEC's preconstruction permitting program and also may be subject to EPA's program. While moored, a portion of emissions-generating equipment on the LNG carrier also will be ~~evaluated~~modeled under NYSDEC's program (and, if applicable, EPA's program). Emissions generated by the FSRU during operations will be subject to the terms and conditions prescribed in the Title V operating permit issued to the Broadwater Project by NYSDEC.

The determination of the impacts of the emissions associated with the Broadwater Project has been accomplished through atmospheric dispersion modeling performed in accordance with applicable NYSDEC/EPA requirements. This modeling demonstrates that the emissions from the Broadwater Project will have only minor impacts on the Long Island Sound coastal area.

The only other emissions from operation of the Broadwater Project will be those of the LNG carriers as they transit the Sound to and from the FSRU. These emissions will not, however, occur continuously since the LNG carriers will travel to and from the FSRU on a staggered schedule. These emissions also will be subject to General Conformity requirements and, if necessary, will be offset through the use of Emission Reduction Credits or other emission offsets acceptable to NYSDEC and EPA.

Additional information regarding the existing air quality conditions of the region and the Project's anticipated impacts on air quality are contained in Appendix C.

**POLICY 8:** *Minimize environmental degradation in the Long Island Sound coastal area from solid waste and hazardous substances and wastes.*

- 8.1 *Manage solid waste to protect public health and control pollution.*
- 8.2 *Manage hazardous wastes to protect public health and control pollution.*
- 8.3 *Protect the environment from degradation due to toxic pollutants and substances hazardous to the environment and public health.*
- 8.4 *Prevent and remediate discharge of petroleum products.*
- 8.5 *Transport solid waste and hazardous substances and waste in a manner which protects the safety, well-being, and general welfare of the public; the environmental resources of the state; and the continued use of transportation facilities.*

The Broadwater Project is consistent with and furthers the objectives of this policy, because the Broadwater Project is designed to minimize generation of solid wastes and hazardous wastes and substances and, where such wastes and substances are produced, to contain and properly dispose of them. There are unlikely to be any threats to human safety or Long Island's coastal resources as a result of contamination from the Project. As such, the Project is consistent with this policy.

There will be no discharge of solid or hazardous waste to the waters of the Long Island Sound due to the operation and construction of the Broadwater Project. All solid waste

generated on board the FSRU will be containerized and shipped to shore for appropriate disposal at an approved facility.

Containerized wastes will be transferred to utility boats and secured prior to departure from the FSRU. The transfer of waste material from the FSRU will have no adverse affects on other users of the Sound, as utility type boats are commonplace in the Sound. At the waterfront facility, waste materials will either be directly loaded onto trucks to be hauled off-site, or will be temporary stored in their containers until they can be loaded onto trucks.

While hazardous materials will be required for routine operations on the FSRU, these materials will be properly managed to prevent discharge to the Sound. Aqueous ammonia and odorant (mercaptan or similar) will be the two primary bulk materials used during the operation of the FSRU that will require regular transshipment. Mercaptan will be transported and stored using approved ISO tanks, which are commonly used for the intermodal transport and storage of freight. These containers are issued with a container safety certificate provided by the manufacturer that must be renewed every 30 months after a review by a certified inspector. These reviews will ensure the structural integrity of the container thereby, minimizing the potential for spills and associated releases to the aquatic environment. On-deck facilities requiring maintenance (i.e., oiling and greasing) will be contained so that stormwater can be routed to appropriate holding tanks and shipped to shore for disposal.

To allow for black start of FSRU equipment, the FSRU will require the storage of marine grade diesel. Storage tanks for this fuel will be integrated into the hull of the FSRU. This onboard diesel will minimize the need to frequently resupply the FSRU's fuel source and will avoid the inadvertent release of diesel into Long Island Sound.

In the event of unanticipated releases of LNG from the FSRU or LNG carriers, such releases would vaporize almost instantaneously, creating only minimal short term impacts with no long term residual impacts.

In addition to the Broadwater Project's design and containment measures that will limit the potential for discharges of solid or hazardous wastes from the on and offshore facilities, Broadwater is developing a site-specific SPCC for all project-related activities. Broadwater will also develop a Facility Response Plan to address unlikely scenarios of releases to the Sound. This plan will be reviewed and approved by the U.S. Coast Guard and NYSDEC prior to initiation of facility operations.

For all these reasons, the Broadwater Project is consistent with this policy.

**POLICY 9:** *Provide for public access to, and recreational use of, coastal waters, public lands, and public resources of the Long Island Sound coastal area.*

- 9.1 *Promote appropriate and adequate physical public access and recreation throughout the coastal area.*
- 9.2 *Provide public visual access from public lands to coastal lands and waters or open space at all sites where physically practical.*
- 9.3 *Preserve the public interest in and use of lands and waters held in public trust by the state, New York City, and the towns of Nassau and Suffolk counties.*
- 9.4 *Assure public access to public trust lands and navigable waters.*

Broadwater is consistent with and furthers the objectives of this policy because the introduction of the much-needed, new energy source from overseas into the target markets using the preferred siting location, design, and technology will not impact public access to the onshore public lands and public resources of the Long Island Sound coastal area. In addition, the Broadwater Project will substantially preserve public access to, and recreational use of, coastal waters with limited, primarily temporary restrictions on public access that are resoundingly outweighed by the demonstrated need for a new energy supply in the region and to adequately provide for the safety of the public. The Broadwater Project has been proposed in a location and has adopted a design that will avoid and minimize impacts to other commercial and recreational water-dependent users of Long Island Sound compared to potential impacts that would result from other alternatives, most notably those involving onshore siting. Where, as here, there is an overarching public benefit from a project that will only marginally affect public access to and commercial and recreational uses of coastal waters, public lands, and public resources, the project is consistent with the objectives of the public trust doctrine. The Broadwater Project concurrently advances the public interest by providing a solution to increasing regional energy demands while substantially preserving public access and recreational and commercial uses within the Sound. For these reasons, which are discussed in greater detail below, the Broadwater Project is consistent with the objectives of this policy.

***With the Broadwater Project, There Will Be Adequate Physical Public Access and Recreation Throughout the Coastal Area***

The Broadwater Project is consistent with the goals of this policy because it respects the importance of maintaining existing physical public access to coastal areas. Importantly, the construction and operation of the Broadwater Project will not result in restrictions to existing physical access areas of coastal lands or the shoreline of Long Island Sound. And because the Broadwater Project will locate its onshore support facilities at existing commercial/industrial properties that are not proximally located near public access areas that are used to reach the coast or water, the Broadwater Project will not impact or diminish existing or future opportunities for physical access to Long Island's publicly owned foreshore, water's edge, or publicly owned lands adjacent to these areas. Moreover, Broadwater is establishing and funding a Social Investment Program that will work with various state agencies, municipalities, and not-for-profit organizations to identify and support projects and programs that promote and provide for public access to, and recreational use of, coastal waters, public lands, and public resources of the Long Island Sound coastal area.

Minimal marine use conflicts may result from the construction and operation of the Broadwater Project. Such potential conflicts, however, are countered by the need for the Broadwater Project and the continued availability of appropriate and adequate physical public access and recreation to the Sound. There are nearly ~~1,300~~1,320 square miles of water within the Sound. WSR § 8.2. Correspondingly, there are a multitude of locations and areas within the Sound that will remain available for public access and recreation -- without any restrictions whatsoever -- when the Broadwater Project becomes operational. To the extent that there are restrictions of certain portions of the Sound, those restrictions will be primarily of limited size and duration. The primary restrictions facing other water dependent users of the Sound will result from U.S. Coast Guard-designated safety and security zones that will "travel" with LNG carriers transiting to and from the FSRU. The U.S. Coast Guard-imposed safety and security zone around the FSRU will not measurably impact the Sound. ~~If the U.S. Coast Guard establishes a 1,000~~The recommended 1,210 yard safety and security zone around the FSRU as anticipated, it would affect less than ~~1~~only 0.12% of the approximately ~~1,300~~1,320 square miles of total navigable water in Long Island Sound. ~~(See Table 39).~~Id. In addition, the recommended safety/security zones around the LNG carriers while in transit in Long Island Sound will be temporary and are not expected to last longer than 15 minutes at any location.

During the siting process for the Project, Broadwater gave the highest consideration to selecting a location and design for the LNG terminal that substantially preserves public access to and along the coast and within Long Island Sound's waters and minimizes conflicts with other existing water-dependent users of the Sound. Broadwater completed a comprehensive, comparative analysis for multiple sites in Long Island Sound, both on-and offshore. The Broadwater Project in its current location and configuration represents the area within the Sound that is the most protective of other commercial, industrial, and recreational water-dependent users within the Sound and results in the least conflict with such other users. Broadwater's analysis of the most likely and reasonable alternatives is set forth in Section 2.2.

### *The Broadwater Project's Compatibility With Existing Uses Within Long Island Sound*

#### *Broadwater's Estimates for the Analysis of Recommended U.S. Coast Guard-designated Safety and Security Zone Are Conservative*

Broadwater's analysis of the potential use conflicts resulting from the construction and operation of the FSRU, LNG carrier routes and associated safety and security zones with other water-dependent uses confirms that the Broadwater Project is consistent with the objectives and goals of continuing public access to, and recreational use of, coastal waters, public lands, and public resources in the Long Island Sound coastal area. ~~Although the~~The U.S. Coast Guard recommended safety and security zones for the FSRU and LNG carrier ~~have not yet been defined, for purposes of this policy analysis, Broadwater assumes conservatively that these U.S. Coast Guard-imposed~~in the WSR §§ 4.6.1.5, 5.5.5, 8.2. The recommended safety and security zones will be approximately ~~1,000~~1,210 yards as referenced to the center of the mooring tower for the FSRU and ~~880~~2 miles ahead, 1 mile behind, and 750 yards ~~onto~~ either side for the LNG carrier. ~~Stated another way, Broadwater has identified the anticipated largest U.S. Coast Guard-imposed safety and security zones for the FSRU and LNG carriers, respectively, and~~WSR §§ 4.6.1.4., 5.5.5. Broadwater has addressed the potential effects of these recommended safety and security zones on existing commercial and recreational marine

~~uses under each such scenario. In this way, Broadwater conservatively estimates its analysis of the potential marine use conflicts that may result once the U.S. Coast Guard establishes the safety and security zones.~~ The establishment of the safety and security zones by the U.S. Coast Guard are federal activities and as such will be subject to the U.S. Coast Guard's consistency review and standards under 15 C.F.R. Part 930, Subpart C.

### ***Potential Marine and Land Use Conflicts With the Broadwater Project***

Broadwater's analysis of potential use conflicts also incorporates and relies upon the Coast Guard's recommended 1,210 yard safety and security zone and an economic impact study completed by Broadwater that identifies potential public access conflicts that may result between marine and onshore uses with the Broadwater Project. Broadwater completed this analysis as part of its due diligence evaluation relative to the coastal zone consistency determination and certification process. Certain aspects of Broadwater's economic analysis were completed at the direction of the NYSDOS. The purpose of this analysis is to investigate whether potential conflicts resulted in economic losses to commercial fishing (lobster fishery, finfish fishery), recreation and tourism, navigation, and vessel traffic industries, and, if so, to what extent. The primary results of the Broadwater Marine/Land Use Compatibility Assessment and related economic analysis are provided below. A complete copy of the Economic Impact Study is attached as Appendix F. A complete copy of the Marine/Land Use Compatibility Assessment is attached as Appendix E.

Broadwater's analysis of the Project (during both the construction phase and operating periods) relative to existing uses of marine and coastal resources within Long Island Sound establishes the Project's consistency with this policy, as more fully set forth below.

### ***Commercial Fishing***

The commercial fishing industry, which involves all portions of Long Island Sound, provides many jobs and contributes millions of dollars to the economies of both New York and Connecticut. Commercial fishing in the Sound targets both finfish and shellfish (including bivalves and the American lobster). Hard clams and Eastern oyster are the most actively fished commercial species in the region, accounting for more than 74% of the total revenues in 2001. Given Broadwater's location in the deeper waters of the central Sound, impacts to the hard clam and oyster industries, which are located primarily in the shallower waters nearer to shore are avoided, thus preserving the most economically important component of the commercial fishery.

### ***Lobster Fisheries***

Historical use maps of the area where the FSRU and interconnection pipeline will be located are classified as a high-use lobster fishery area. As a result, Broadwater completed an analysis to estimate the potential conflicts with the lobster industry and estimate any potential, resulting economic losses.<sup>8</sup> Based on data and assumptions that were used to estimate the value of lobster landings, Broadwater's impact estimates to lobster fisheries are predicated on the

<sup>8</sup> Broadwater will compensate displaced fishermen and lobstermen for demonstrated losses of income as a result of the Broadwater Project.

~~anticipated~~**recommended** U.S. Coast Guard-designated safety and security zone area extending 1,000**1,210** yards from the FSRU mooring tower and cover the time period from 2010 to 2040. Further explanation of the assumptions and parameters used to estimate lobster impacts are provided in the Broadwater Economic Impact Study (*see* Appendix F).

### *Economic Effects of Potential Lobster Fisheries Conflicts*

Estimates were made on the future annual landings of lobster for the ~~assumed~~**recommended** safety and security zone. Detailed procedures and methodologies employed for this study, which addresses the value of average landings and density of lobster pots in Long Island Sound, are provided in Appendix B. It is important to note that the economic studies conducted for the Broadwater Project are Sound-wide analyses with no artificial constraints associated with the New York/Connecticut state line. Figure 39 shows the area likely to be covered by the **recommended** U.S. Coast Guard-designated safety and security zone.

Using average annual landings and a potential range of lobster pots per trap line in Long Island Sound, the analysis suggests that a restricted access area of 1,000**1,210** yards from the center of the mooring tower would correspond to annual lobster landings valued at between approximately \$5,000**8,000** and \$20,000**32,000** per year depending on the number of pots attached to a trap line. In other words, for 15 pots per trap line, the annual value of landings would correspond to approximately \$15,000**24,000** (*see* Table 35).

**Table 35 Direct Economic Impacts-Summary Analysis  
Based on Range of Lobster Pots per Trap Line**

Pots per Trap Line	Yards from Mooring Tower
	1,000
<b>Value of Average Annual Landings (2010-2040)</b>	
5	\$5,029 <b>8,042</b>
10	\$10,059 <b>16,084</b>
15	\$15,088 <b>24,126</b>
20	\$20,118 <b>32,168</b>
<b>Cumulative Present Value of Future Annual Landings (2010-2040)</b>	
5	\$81,442 <b>130,224</b>
10	\$162,883 <b>260,447</b>
15	\$244,325 <b>390,671</b>
20	\$325,766 <b>520,894</b>

To assess the corresponding estimated lost revenue to area commercial lobstermen, Broadwater compared this data to recent estimates of the total value of lobster landings for the eastern Long Island Sound region, the entire Long Island Sound, and New York State.

Broadwater also estimated the indirect and induced impacts for the purpose of identifying the scope and magnitude of potential conflicts with the lobstering industry. Direct expenditures have an indirect economic impact or stimulus on the suppliers and firms that are the



recipients of these subsequent rounds of spending. In addition, employees and households that earn wages from these industries are also impacted by these expenditures and they in turn spend a portion of their incomes in New York State. These latter impacts are called induced effects. The direct, indirect, and induced impacts are summed and collectively are called total economic impacts. The indirect and induced impacts represent the multiplier or ripple effects that are generated from the initial direct expenditures from the lobster landings revenues.

The economic impacts associated with the potential loss of lobster revenues ~~per each potential~~**for the recommended** U.S. Coast Guard-imposed safety and security zone alternative were estimated for an average year and also over the anticipated long-term, 30 year operational life of the Broadwater Project. The long-term impacts were estimated for each year over the life of the Broadwater Project and also expressed as a cumulative present value sum. The cumulative present value sum is a measure of the total long-term impact in present worth terms. Table 36 summarizes the estimated economic impacts for the safety and security zone broken down into the following components: the annual total industry output, the broadest measure of total economic impacts for an average year and the cumulative present worth measured over the 30 year economic life of the project; the impacts to employee compensation; total value added; and employment. ~~If a 1,000~~**With the recommended 1,210** yard safety and security zone is established for the Broadwater Project, the total economic impact to the commercial lobster fishing industry (accounting for potential losses through 2040) is estimated at approximately ~~\$381,000~~**649,000**.

**Table 36 Summary of Economic Impacts to NYS Associated with Ocean Area Sizes Equivalent to the FSRU Safety and Security Zone-Average Year and Long-Term Cumulative Impacts**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
	Safety and Security Zone Alternative	
	1,000	1,000
<b>Total Industry Output</b>		
Direct	\$15,088 <u>24,126</u>	\$190,817 <u>324,96</u> 9
Indirect	\$5,837 <u>9,333</u>	\$73,819 <u>125,717</u>
Induced	\$9,197 <u>14,706</u>	\$116,315 <u>198,08</u> 9
Total	\$30,122 <u>48,166</u>	\$380,951 <u>648,77</u> 5
<b>Employee Compensation</b>		
Direct	\$3,493 <u>5,585</u>	\$44,175 <u>75,231</u>
Indirect	\$2,018 <u>3,227</u>	\$25,519 <u>43,460</u>
Induced	\$2,920 <u>4,669</u>	\$36,930 <u>62,894</u>
Total	\$8,431 <u>13,481</u>	\$106,624 <u>181,58</u> 5
<b>Total Value Added</b>		
Direct	\$9,389 <u>15,013</u>	\$118,742 <u>202,22</u> 2
Indirect	\$3,368 <u>5,386</u>	\$42,599 <u>72,547</u>
Induced	\$5,923 <u>9,471</u>	\$74,907 <u>127,570</u>
Total	\$18,680 <u>29,870</u>	\$236,248 <u>402,34</u>

		<u>0</u>
<b>Employment</b>		
Direct	<del>0.81</del> <u>1.3</u>	<del>2540</del>
Indirect	<del>0.00</del> <u>1</u>	<del>12</del>
Induced	0.1	<del>24</del>
Total	<del>1.01</del> <u>1.5</u>	<del>2946</del>

### Commercial Finfishing

Broadwater also conducted an analysis of potential effects of the Broadwater Project on the commercial finfishing industry. Based on information obtained from local fishermen and available fishery data, the transitional and mud bottoms of the Sound attract a high number and diversity of fish. Consistent with the information in the Lobster Fisheries section above information provided by local fishermen indicates that nearly the entire western two-thirds of the Sound, including the location for the FSRU and interconnection pipeline is a high-use lobster fishery area. As a result of the high density of lobster traps in New York waters throughout the central and western basins of the Sound, commercial finfishing is currently limited in the Broadwater Project area.

Broadwater also completed a fishermen outreach program to identify potentially interested parties that use the Sound for commercial and recreational fishing and to identify those who may be impacted by the construction and/or operation of the Broadwater Project. Information obtained from commercial and recreational fishermen through a telephone survey included: areas fished in Long Island Sound, targeted species, gear type, seasons fished, and concerns, if any, related to the proposed Broadwater Project. The outreach program also included a review of information provided by NOAA Fisheries related to catch in the Broadwater Project area.

The results of Broadwater's survey and analysis of fishery data and the fishermen outreach program are fully set forth in Appendix H. The primary information from that data and outreach program is summarized below.

### Trawling Lanes

In general, trawling is limited in the Sound due to the predominance of fixed-gear commercial lobster fishing. In order to avoid conflict between fishermen using fixed gear and fishermen who trawl, specific areas have been agreed upon as trawling lanes. Trawling lanes were identified during the initial consultation with local fisherman and are consistent with information presented in the *Environmental Impact Statement for the Designation of Dredge Material Disposal Sites in Central and Western Long Island Sound, Connecticut and New York* (EPA 2004). Designated trawling lanes in Long Island Sound are shown on Figure 40.

The FSRU and the associated ~~1,000~~recommended 1,210 yard safety and security zone will likely result in the elimination of some available commercial fishing grounds to finfish. While some limited access to the safety and security zone may be permitted by the U.S. Coast Guard, potentially reducing any resulting impacts, for the purposes of this analysis, Broadwater has assumed (without agreeing) that the establishment of a safety and security zone around the FSRU will prohibit any access by fishermen, thus providing the most conservative assessment. The WSR identifies one trawl lane approximately 61 yards north of the proposed FSRU



location. WSR § 3.1.2.3.1. A second trawl lane is located in Connecticut State waters running approximately 2.3 to 5.4 miles offshore between Guilford, Connect and Milford, Connecticut. Id. According to the WSR, "[v]ery few commercial trawl fishing vessels utilize these lanes. It is estimate that at most 6 trawlers utilize these lanes; generally, fishing occurs in summer, primarily during the month of August." Id.

As discussed below, the projected economic losses associated with the Broadwater Project are not significant in terms of the overall finfishing industry production. The economic impacts to the commercial finfishing industry are more than offset when compared to the overall economic benefits that will result from the construction and operation of the Broadwater Project. In addition, Broadwater is committed to compensating displaced fishermen that demonstrate a loss of commercial fishing grounds as a result of the Broadwater Project. As such, the limited, adverse economic impacts to the commercial finfishing industry can be readily offset by Broadwater.

As illustrated on Figure 40, the trawling lane that parallels the New York and Connecticut border may be impacted by the Project. The impact to the trawling lane would occur from the FSRU itself as well as the ~~potential~~recommended U.S. Coast Guard-designated safety and security zones. However, as illustrated on Figure 40, the established trawling lane is wide enough to accommodate trawling to the north. The following section provides an evaluation and estimate of the value of commercial finfishery landings that would potentially not be accessible over the FSRU's estimated 30 year lifetime. The complete economic impact study evaluating impact to commercial fisheries, recreation and tourism, and vessel traffic is attached as Appendix F.

The future annual value of commercial finfish landings for the period from 2010-2040 are defined as the direct economic impact. The impact estimates are presented for an average year, and for a long-term time horizon spanning the life of the Project. The method used to estimate the value of commercial finfisheries landings was based on using an extract of the commercial species landings data within the east end and west end Long Island Sound data provided in the Fisherman's Outreach report (*see* Appendix H). Broadwater estimated the value of landings potentially affected by the ~~anticipated U.S.~~recommended Coast Guard-imposed ~~1,000~~ 1,210 yard safety and security zone surrounding the FSRU by scaling the available landings data to the acreage affected by the safety and security zone. (*see* Figures 39 and 40.1). (*see* Figure 39). The annual value of landings corresponding to these species within the circular area was projected forward in time over the 30 year life of the Broadwater Project to arrive at an estimate of long-term impacts. No assumptions were made concerning species population growth or catch effort over this time period. The direct economic impacts or value of commercial fish landings represent order of magnitude estimates using available information.

**Table 37 Species, Total Live Pounds, and Estimated Value of Fish Harvested in Long Island Sound Commercial Fisheries During the 2002 and 2003 Fishing Seasons as Provided by NOAA and Estimated Values**

Long Island Sound East to West End Ocean Area <sup>a</sup>				Anticipated Proposed Safety and Security Zone Ocean Area Surrounding Project FSRU	
No.	Species	Pounds	Value	Landings in Pounds	Estimated Value of Landings
				1,0001,210 yds	1,0001,210 yds
1	Angler	43,680	\$34,462	<del>503.9</del> <u>838.91</u>	<del>\$354.5</del> <u>\$661.87</u>
2	Scup	40,733	\$29,200	<del>469.9</del> <u>782.31</u>	<del>\$377.8</del> <u>\$560.81</u>
3	Bluefish	14,827	\$5,130	<del>171.1</del> <u>284.76</u>	<del>\$51.2</del> <u>\$98.53</u>
4	Flounder, Summer	12,513	\$24,744	<del>144.4</del> <u>240.32</u>	<del>\$291.8</del> <u>\$475.22</u>
5	Tautog	3,642	\$6,117	<del>42.0</del> <u>69.95</u>	<del>\$85.2</del> <u>\$117.48</u>
6	Butterfish	3,527	\$2,138	<del>40.7</del> <u>67.74</u>	<del>\$25.5</del> <u>\$41.07</u>
7	Squid (Loligo)	1,810	\$1,358	<del>20.9</del> <u>34.76</u>	<del>\$16.9</del> <u>\$26.08</u>
8	Skates	1,767	\$251	<del>20.4</del> <u>33.94</u>	<del>\$2.8</del> <u>\$4.82</u>
9	Sea Robbins	1,222	\$202	<del>14.1</del> <u>23.47</u>	<del>\$1.8</del> <u>\$3.89</u>
10	Sea Bass, Black	1,093	\$2,609	<del>12.6</del> <u>20.99</u>	<del>\$30.0</del> <u>\$50.11</u>
11	Flounder, Yellowtail	770	\$846	<del>8.9</del> <u>14.79</u>	<del>\$11.8</del> <u>\$16.25</u>
12	Flounder, Winter	572	\$648	<del>6.6</del> <u>10.99</u>	<del>\$8.2</del> <u>\$12.44</u>
13	Bass, Striped	272	\$681	<del>3.1</del> <u>5.22</u>	<del>\$7.4</del> <u>\$13.08</u>
14	Dogfish, Smooth	189	\$58	<del>2.2</del> <u>3.63</u>	<del>\$0.6</del> <u>\$1.12</u>
15	Hake, Red	92	\$37	<del>1.1</del> <u>1.77</u>	<del>\$0.5</del> <u>\$0.70</u>
16	Croaker, Atlantic	26	\$13	<del>0.3</del> <u>1.05</u>	<del>\$0.2</del> <u>\$0.25</u>
17	Eel, Conger	25	\$14	<del>0.3</del> <u>0.48</u>	<del>\$0.1</del> <u>\$0.27</u>
18	Bonito	12	\$18	<del>0.1</del> <u>0.23</u>	<del>\$0.1</del> <u>\$0.35</u>
19	Flounder, Sand-Dab	4	na	<del>0.0</del> <u>0.08</u>	na
<b>Total:</b>		<b>126,776</b>	<b>\$108,527</b>	<b><del>1,463</del><u>2,434.83</u></b>	<b><del>\$1,267</del><u>\$2,084.34</u></b>

Table 37 shows the results of the scaling calculations using the relative number of trawl area acres to estimate the value of fish landings. The table shows that applying this method, the **recommended** FSRU safety and security zone areas would correspond to several thousand dollars worth of fish landings within an average year.

The estimated commercial landings in pounds were held constant over the projection period but the annual unit value (\$/lb), used to calculate the annual value of landings was increased over time based on the historic trend growth rate for all combined species. The long-term or cumulative direct impact over the 30 year life of the Broadwater Project is estimated at approximately ~~\$22,000~~**\$36,000** in present value terms.

The economic impacts associated with the potential loss of commercial fisheries were estimated for an average year, and also over the long-term 30 year operational life of the Project. The long-term impacts were estimated for each year over the life of the Broadwater Project and also expressed as a cumulative present value sum. The cumulative present value sum is a measure of the total long-term impact in present worth terms.

Table 38 summarizes the estimated direct, indirect, and induced economic impacts. Anticipated conflicts with commercial fisheries are projected to be relatively small or negligible. There would be virtually no impact on employment levels for the commercial fishing industry attributable to the loss of access to the waters by virtue of the recommended safety and security and safety zones.

**Table 38 Summary of Economic Impacts to NYS Commercial Fisheries Average Year and Long-Term Cumulative Impacts**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
	Anticipated	Proposed U.S. Coast Guard Safety and Security Zone
	1,0001,210 yds	1,0001,210 yds
<b>Total Industry Output</b>		
Direct	\$1,3282,211	\$21,51035,809
Indirect	\$514855	\$8,32113,853
Induced	\$8101,348	\$13,11221,828
Total	\$2,6524,415	\$42,94371,489
<b>Employee Compensation</b>		
Direct	\$308512	\$4,9808,290
Indirect	\$178296	\$2,8774,789
Induced	\$257428	\$4,1636,930
Total	\$7421,236	\$12,01920,009
<b>Total Value Added</b>		
Direct	\$8271,376	\$13,38522,283
Indirect	\$297494	\$4,8027,994
Induced	\$521868	\$8,44414,057
Total	\$1,6452,738	\$26,63244,334

### *Navigable Waters and Vessel Traffic*

The Broadwater Project is also consistent with the objectives of Policy 9 as it substantially assures continued public access to public use of the Sound's navigable waters, including commercial vessel traffic. Long Island Sound supports significant commercial/industrial vessel transits as the primary thoroughfare accessing the established industrial ports on the Long Island Sound coastline. These navigation-dependent activities have historically been and continue to be very important to the economies of New York and Connecticut. Significantly, navigation-dependent activities remain a very active part of how the main body and port areas of Long Island Sound are used today. Broadwater purposely sited the FSRU and interconnecting pipeline in their proposed locations to avoid and minimize water-use conflicts with existing shipping and use of navigable waterways.

The main shipping route in Long Island Sound runs generally down the center of the Sound on a straight course from deepwater areas in the eastern Sound to the deepwater pass through Stratford Shoal. A second primary shipping route exists on a northeast to southwest alignment toward the Northport Harbor area in New York. From both of the two primary east-west shipping routes, traffic branches to enter the existing deepwater ports throughout the Sound. The FSRU was sited between the two primary east-west shipping routes to minimize impacts on commercial/industrial vessel transits.

A There is a potential for conflict exists ~~with~~ between the historic shipping route that traverses the central portion of the Sound as a result of the ~~anticipated establishment of~~ arecommended U.S. Coast Guard-imposed safety and security zone around the FSRU. A ~~1,000~~ 1,210 yard safety and security zone for the FSRU measured from the mooring tower as the center point would result in potential impacts to existing shipping routes based on the U.S. Coast Guard ~~provided~~ transit data. Given the breadth of the shipping route as reflected on the U.S. Coast Guard data, however, this potential conflict is very manageable and will have little impact on vessels accessing these transit routes. This is because large commercial/industrial vessels transiting the Sound are piloted by local pilots who are well aware of existing limitations and would certainly be so with respect to any such constraints associated with the FSRU. Therefore, once the recommended U.S. Coast Guard ~~establishes the~~ safety and security zones go into effect, vessel pilots can modify their course of transit accordingly. And as a result of the Broadwater LNG terminal's location in the widest portion of the Sound, there are unlikely to be significant vessel use conflicts as there remains ample space to allow for navigation outside the ~~anticipated 1,000~~ recommended 1,210 yard U.S. Coast Guard-established safety and security zone. The greatest potential for marine conflict would arise from the ingress and egress of LNG carriers transiting to and from the FSRU. Such conflicts are most likely to arise in the Race, which constricts traffic flow between the Atlantic Ocean and Long Island Sound. The Race is heavily traveled and occasionally ~~results in a bottleneck that requires passing vessels to merge into a two nautical mile corridor over three nautical miles~~. Vessels using the Race include a broad mix of naval vessels with a surrounding security zone, commercial deep draft vessels, commercial fishing vessels, and recreational fishing and pleasure crafts. Vessels that are not deep draft will be able to pass through the Race simultaneously with LNG carriers because shallower draft vessels can travel closer to shore. The Race does not currently have a Traffic Separation Schedule (TSS). Based on a review of existing NOAA charts, the transiting LNG carrier would not result in situations that would prevent commercial or non-commercial traffic



from transiting the Race. In addition, the Captain of the Port of Long Island Sound, U.S. Coast Guard Captain Peter Boynton, has confirmed that directing both submarine and LNG carrier traffic in Long Island Sound is manageable.<sup>9</sup> **The WSR supports this position by further stating that the impacts of the moving safety and security zones around LNG carriers on other waterway users of the Sound are manageable. WSR §§ 8.2, 8.3.** The issue is one of simple traffic management based on vessel traffic through the Race, which will remain open and passable with only temporary access limitation as LNG carriers pass through.

Consistent with common maritime practice, commercial vessels will have pilots on board to allow for close coordination of incoming and outgoing commercial vessels through the Race. Continued coordination between the pilots will assure that conflicts are appropriately managed. For example, it is unlikely that an LNG carrier and a commercial/~~industrial~~ vessel can simultaneously pass the Race due to the narrow passage and likely exclusion zone requirements. Therefore, if an LNG carrier and commercial vessel arrive at the Race at the same time, ultimately one of the vessels will need to wait until the other has passed. Broadwater estimates that it would take approximately 15 minutes for an LNG carrier to pass through the Race, resulting in no significant delay for other commercial/~~industrial~~ vessels. Broadwater anticipates that only two to three carriers per week would call on the FSRU, minimizing potential conflict at the Race. **WSR § 8.2.**

The LNG carriers could encounter ferry traffic on their ingress and egress to the FSRU. Broadwater will be able to minimize potential conflicts by considering the schedules of the ferries when scheduling the LNG carriers. Close coordination with the ferry captains will function to minimize potential conflict.

Approximately 46 million tons of petroleum and coal products are moved by barge or other vessels to reach Long Island Sound coastal zone markets each year. The Broadwater Project's annual energy importation would be equivalent to 7 million tonnes (metric) per year of LNG. This comparison shows that the Broadwater Project's energy imports would not create a significant increase in the commercial/~~industrial~~ traffic on the Sound.

Last, no significant, permanent impacts on or conflicts with commercial/~~industrial~~ shipping from installation or operation of the subsea pipeline are expected. Installation of the pipeline will be completed in an approximately 6-month time frame between October and April, when there is reduced vessel traffic within Long Island Sound.

### ***Potential Vessel Use Conflicts Will Not Create Adverse Economic Impacts***

The location of the FSRU and safety and security zone footprint will not result in an economic impact. With respect to economic impacts on commercial vessels, some transiting vessels may need to navigate around this FSRU location, however there is sufficient room or bandwidth within the established shipping lanes to easily accommodate these changes without imposing additional operational costs to commercial/~~industrial~~ vessel operators. Historically, commercial vessels and navigators have become familiar with noteworthy parts of Long Island

<sup>9</sup> See "CG Captain Sees Subs, Tankers Co-existing; Security zones for LNG vessels in L.I. Sound viewed as routine," Paul Choiniere, *The Day*, 3/16/06.

Sound such as shoals and the Race narrows and have historically adjusted and adapted their behavior without incurring any disruptions to economic activity.

Furthermore, as the Long Island Sound Waterborne Transportation Plan indicates, most water-borne freight, consisting of heavy bulk commodities, is not time sensitive or tied to just-in-time inventory schedules as the freight mostly serves service sectors of the regional economy and not manufacturing. This fact suggests that the possibility of minor delays to shipping traffic resulting from FSRU operations, if any, would not have a negative economic impact on or conflict with these sectors.

It is reasonable to expect that once Broadwater's LNG terminal operations commence, navigators would become familiar with the Broadwater Project footprint and adjust their behavior to work with and around this site location. The East to West and West to East commercial/industrial freight traffic has adapted to North – South/South-North ferry transits without any interruptions to economic activity. Similarly, the LNG vessel transits to and from the FSRU would be incorporated into existing commercial vessel flow patterns without incurring any impacts to economic activity.

Broadwater's boat survey confirms that large commercial/industrial vessels were primarily observed traveling east-west using established shipping lanes to the north and south of the FSRU; consequently, such vessels would not be impacted by the proposed siting location of the FSRU and are unlikely to sustain economic impacts.

### ***Recreation***

The Broadwater Project is consistent with the LIS CMP objective of protecting and maintaining existing public access and water-related recreation, which, along with tourism, is an important part of both Suffolk County and the Long Island Sound economies. The major recreational uses of the Long Island Sound include such activities as swimming, beach going, recreational/sport fishing, and recreational boating. To determine potential conflicts with recreational users of the Sound and overall consistency with this policy, Broadwater gathered information and data on these recreational activities to determine the frequency of occurrence and annual economic benefits to the Long Island Sound community, in addition to identifying and analyzing potential impacts to such water-related recreational activities resulting from the Broadwater Project.

For the purposes of quantifying recreational spending in the Long Island Sound coastal area, the activities were divided into three categories due to data availability and distinction between activities: beach swimming, recreational/sport fishing, and recreational boating. The results of Broadwater's economic impact study for categories of activities are varied based upon the proximal relationship between where the activity is most likely to occur relative to the FSRU location. For instance, access to coastal land and waters for swimming and beach visitation can not be expected to be impacted or be conflicted with as a result of the Broadwater Project due to the inherent distance from the proposed FSRU location. Alternatively, boating and fishing activities that could take place closer to the FSRU and the surrounding safety and security zone during Broadwater Project operations could be negatively impacted. These recreational activities and estimated conflicts are discussed individually below.

*Beach Swimming.* Beach visitation and swimming are activities confined, by definition, to coastal areas with beaches. Beach visitation and beach swimming result in a variety of economic impacts to the local community through retail purchases, food and beverage purchases, accommodations, and miscellaneous trip expenses (i.e., gas, tolls, etc.). In 1998, the total economic impact of beach swimming in Connecticut and New York was \$622.2 million and \$514.61 million respectively. This equates to a \$1,136.81 million impact total for the Long Island Sound area in 2005 dollars.

The closest coastline to the proposed location of the Broadwater Project is 9 miles away and does not inhibit or alter the ability of residents or tourists from participating in beach-going activities or swimming. As a result, it is estimated that the Broadwater Project will have no impact on this recreational activity or its associated economic impact to the Long Island Sound area. Observations from other coastal communities around the U.S. show that beach attendance has not been affected in any material way by compatible industrial and commercial marine activities. For instance, beach users in South Florida are accustomed to seeing large cargo and freight vessels transit the coastline within their activity view sheds. These economic activities have not detracted from the recreational experience or beach attendance as revealed in the hotel occupancy data figures.

The location of the FSRU, which will be a minimum of 9 miles from the coastline, is unlikely to diminish beachgoers' ability to enjoy swimming and recreating in the Sound. The general sense of place that is appreciated by Long Island residents and that attracts visitors to eastern Long Island, including beachgoers, will not differ appreciably from existing features in the Sound. As discussed above, a beachgoer's sense of and values associated with the Sound is affected by the diverse range of uses and activities within the Sound, as well as other factors and features that may be visible, audible, or present in a particular portion of the Sound on a given day at a particular point in time. An individual's sense of and values associated with the Sound is dependent upon the importance or weight that person ascribes to certain factors that contribute to the overall "sense" and value of the Sound. It is evident, however, that beachgoers are able to continue to enjoy the Sound in the presence of mixed, diverse uses that exist in the Sound's waters. For example, in Riverhead, the Pier Avenue Beach is less than 2 miles from the offshore ConocoPhillips Northville petroleum terminal. The Pier Avenue Beach is heavily used and widely enjoyed by beachgoers, as demonstrated by the picnic partitions, parking, and other public facilities that have been maintained and improved for use by the public. This pattern of use confirms that users of the Pier Avenue Beach do not find the proximity to the Northville petroleum terminal to affect their sense of and values associated with the Sound and certainly not to a point that they no longer desire to go to there.

Similarly, Wading River municipal beach is adjacent to the Shoreham Energy Center (former Shoreham Nuclear facility). Like the Pier Avenue Beach, the proximity of the Shoreham Energy Center to the Wading River Beach does not appear to diminish users' ability to enjoy the coastal resources within the Sound. Adults and children enjoy this beach, including the playground and picnic areas. And as with the Pier Avenue Beach, the Wading River Beach has been maintained and improved to accommodate the public's ability to use and enjoy this beach that is located close to a former nuclear facility. Here, the Broadwater Project will be a minimum of 9 miles from the nearest coastal point, and in many instances, it will be substantially farther away than either the Pier Avenue Beach or the Wading River Beach are from industrial

sites and/or facilities. Based on the historic and continued use of these beach areas in the Long Island Sound coastal region, which continue to sustain a high degree of use and enjoyment by the public even though they are proximally located to industrial sites and facilities, that the Broadwater Project is not likely to negatively impact beachgoers' and other users' "sense" of and values associated with the Sound. (See also Broadwater's response to LIS CMP Policies 1 and 3, above.

The Broadwater Project is also consistent with this Policy because it protects existing visual access to coastal lands and waters. As a result of its location in the central portion of the Sound 9 miles from the coast, the Broadwater Project avoids physical blockage of visual access within the Sound, and "minimizes adverse impact on visual access." While there may be some perceived adverse impact based on the ability to see the FSRU in the Sound when in the near-shore waters or on a beach (depending on location and weather conditions, which both affect visibility), the FSRU will be consistent with other features on the Sound. Thus, it is not anticipated to diminish the average user's enjoyment of the Sound. With the FSRU more than 9 miles offshore from the nearest coastal location -- and in many instances more than double that distance -- there will be a vast expanse of open Long Island Sound water between the viewer and the FSRU. Additionally, the LNG terminal's placement, design, and coloration all serve to minimize adverse visual impacts from the Broadwater Project, including the FSRU. Importantly, because of its distant, offshore location, the FSRU will avoid loss of onshore visual access to the Long Island Sound since there will be no new construction of onshore facilities that will result in physical blockage of existing visual access to the Sound. The FSRU will also be consistent with other large vessels and freight carriers within Long Island Sound, and thus is not anticipated to have a significant impact on recreational users' ability to enjoy the Sound. The potential effects on visual access to the Long Island Sound are discussed in Broadwater's Visual Resources Assessment, which is attached as Appendix K. Because the Broadwater Project will not adversely affect the availability of public access to view Long Island Sound from the shoreline, and because the FSRU and LNG carriers will be consistent with the existing vessel traffic in the Sound, the Broadwater Project is not anticipated to adversely affect visual access to Long Island Sound. Correspondingly, a negative economic impact on beach swimming and/or related recreational activities as a result of the Broadwater Project is not anticipated.

*Recreational Boating.* Long Island Sound is a popular recreational boating area. During construction of the proposed pipeline facilities, there will be temporary and minor loss of recreational boating area in the immediate vicinity of the active work area. Because installation will occur primarily during the fall, winter and spring months, when use of the Sound by recreational boaters is reduced, impacts on recreational boating are minimized. **In addition, according to the WSR, the highest density of recreational boating is generally within 2.3 to 3.5 miles off the shore of both coasts of Long Island Sound. WSR § 3.1.2.3.** Therefore, installation of the facilities is expected to have only minor, if any, impacts on recreational boating. During operation, the proposed pipeline will have no effect on recreational boating due to its installation beneath the seafloor.

As discussed above, recreational boating on Long Island Sound is a significant economic driver and results in several billion dollars in total economic impact annually. The Boat Traffic Survey completed in connection with Resource Report No. 8, Land Use, Recreation and Aesthetics, outlines the approximate boating activity in the vicinity of the Project site during



several of the busiest boating days of the year. A copy of the Boat Traffic Survey is annexed as Appendix I **and is consistent with the findings of the Coast Guard in the WSR.**

Broadwater has analyzed the potential economic impact on recreational boating with the Broadwater Project using the data compiled in the Boat Traffic Survey. Taking the number of boats surveyed in the vicinity of the FSRU, along with the estimated boating season, and expenditure per boat, the total economic impact of the FSRU on recreational boating can be estimated. Based on these calculations, Broadwater estimates a total direct economic impact of \$6,156,640. When measured against a total expenditure for Long Island Sound (inflated to 2005 dollars of \$102,297,238), the potential loss in expenditures equals 6%. However, this presumes that all boats on a course that would take them in the vicinity of the proposed FSRU would opt to stay off the water altogether and would expend absolutely no money on boating activities in the Long Island coastal region, rather than to divert their course. The far more likely scenario, however, is that such boats would choose to avoid the area of the proposed FSRU through prior trip planning or small course adjustments and the more likely overall economic impact, if any, would be minimal or none at all.

There are approximately 844,800 total acres in Long Island Sound (Long Island Sound Study 2006). Assuming 20% of this total area is unavailable because it is not suitable for recreational boating due to the proximity to shore, depth of water, or other obstructions, 675,840 acres of adequate boating water still remains. The percent total of the ~~anticipated~~recommended U.S. Coast Guard-designated safety and security zone compared with the total adequate and available boating area of Long Island Sound is presented in Table 39 below. This table confirms that the ocean area affected by the safety and security zone that would potentially be off limits to recreational and commercial boating represent a minute portion (less than 1%) of the total usable navigable water in Long Island Sound. Therefore, the Broadwater Project is consistent with the goals and objectives of this policy because it is not anticipated to impact the availability of appropriate and adequate physical public access and recreation throughout the coastal area.

Table 39 Percentage of Navigable Water in Long Island Sound

<u>Proposed Security Zone</u>	<u>Acres in Zone</u>	<u>% of Total Long Island Sound</u>
1,000 <u>1,210</u> yard buffer	594 <u>949.7</u>	0.07 <u>.11</u> %

Besides sailing regattas, recreational boaters typically do not follow a specific course and would be able to alter their heading to avoid the FSRU and any security buffer established, without significantly or adversely impacting their trip. With respect to regattas where the course would potentially pass in the vicinity of the FSRU security zone, Broadwater's Boat Traffic Study establishes that there is ample room for the regattas to make minor adjustments to courses, if necessary, to avoid the proposed FSRU location. This would not be considered a significant issue and the Broadwater Project would not prevent any regattas in Long Island Sound.

*Recreational Sport Fishing.* As discussed above, the proposed FSRU as part of the Broadwater Project and the associated safety and security ~~zones~~zone would only occupy a small portion of the Long Island Sound. The Broadwater Project is unlikely to cause undue

restrictions on recreational sport fishing. Table 39 shows a break down in acres of the Long Island Sound waters that would no longer be accessible to anglers for sport fishing with the Broadwater Project. According to the 2001 NY Sea Grant, participation rates for recreational sport fishing have been decreasing since 1994. With this decrease in the overall number of anglers, the conclusion could be drawn that there has been an overall decrease in competition for fishing areas in Long Island Sound. Thus, sport anglers would likely be able to find adequate fishing locations in Long Island Sound outside of the recommended safety and security zones that would be zone associated with the FSRU.

The Stratford Shoal area, which is a popular fishing location and has high fisherman boat traffic as noted in the Boat Traffic Survey, is an estimated 12 miles away from the proposed FSRU location. There would be no conflict between the FSRU and sport fishing in the Stratford Shoal area and the Project.

As a result of these analyses, Broadwater has confirmed that the Broadwater Project is consistent with this policy as it will substantially preserve existing physical access and recreation throughout the coastal area.

**POLICY 10:** Protect Long Island Sound's water-dependent uses and promote siting of new water-dependent uses in suitable locations.

- 10.1 *Protect existing water-dependent uses.*
- 10.2 *Promote maritime centers as the most suitable locations for water-dependent uses.*
- 10.3 *Allow for development of new water-dependent uses outside of maritime centers.*
- 10.4 *Improve the economic viability of water-dependent uses by allowing for non-water-dependent accessory and multiple uses, particularly water-enhanced and maritime support services.*
- 10.5 *Minimize adverse impacts of new and expanding water-dependent uses, provide for their safe operation, and maintain regionally important uses.*
- 10.6 *Provide sufficient infrastructure for water-dependent uses.*
- 10.7 *Promote efficient harbor operation.*

Broadwater is consistent with and furthers the objectives of this policy, since it proposes the siting of a new, much-needed water-dependent energy business activity in a suitable location within Long Island Sound. Indeed, LIS CMP Policy 13.4 specifically contemplates LNG facility within the Sound. Likewise, New York State's CMP recognizes the importance that the state's coastal resources play in satisfying the state's energy needs. The federally-approved FEIS for New York State's CMP states that New York's coast "provides sites for numerous energy facilities, including ... gas transmission lines; oil and gas exploration, development, transfer and storage facilities (including LNG facilities) .... (emphasis supplied). NYS CMP FEIS, II-5-37. New York's recognition that certain energy facilities are water-dependent is consistent with the federal CZMA's recognition that energy facilities -- including LNG facilities such as the Broadwater Project -- are coastal dependent and must be given priority consideration in coastal management decisions. *See* CZMA § 303(2)(d); *see also* 71 Fed. Reg. 788 ("The CZMA requires States to consider the national interest as stated in the CZMA objectives and give priority consideration to *coastal dependant* uses and processes for facilities related to ... energy... when adopting and amending their [CMPs] and when making coastal management decisions.") (emphasis supplied).<sup>10</sup>

### ***The Broadwater Project is a Much-Needed Water Dependent Use***

The business that is the Broadwater Project -- serving the target markets with overseas-sourced energy -- can only be conducted in/on and adjacent to Long Island Sound because the business requires direct access to the Sound. Additionally, the use of Long Island Sound is an integral part of the business of the Broadwater Project. As such, the Broadwater Project is a water-dependent use and a coastal dependent use.

<sup>10</sup> To the extent there is a definitional difference perceived between a "coastal dependent use" and a "water dependent use," the "coastal dependent use" definition controls the outcome. *See* CZMA Federal Consistency Regulations, 71 Fed. Reg. 788, 789 (Jan. 5, 2006, to be codified at 15 CFR Part 930). But because the Broadwater Project satisfies both definitions, any perceived or real differences in the two terms is inconsequential here.

The LIS CMP provides the following definition: "Water-dependent use means a business or other activity which can only be conducted in, on, over or adjacent to a water body because such activity requires direct access to that water body, and which involves, as an integral part of such activity, the use of the water." LIS CMP Definitions, Ch. 4; *see also* N.Y.C.R.R. tit. 19 § 600.2(ag).

The water-dependency of the business here -- the Broadwater Project -- is manifest. The Broadwater business is the receipt of LNG from overseas locations and the transportation of the resulting natural gas to the target markets of Long Island, New York City, the New York City metropolitan region, and Southern Connecticut (collectively, target markets). This business is, without question, water-dependent under the LIS CMP (as well as a coastal-dependent energy facility under the CZMA). First, overseas-sourced LNG must be shipped from international waters, through the Atlantic Ocean, and into Long Island Sound. In order to obtain the quantity of LNG that the Broadwater Project requires to satisfy the needs and demands of the target markets for economical natural gas, waterborne transportation is the only feasible method of delivery. It is not possible to transport the needed LNG via air or road transport. In addition, the transfer of LNG from LNG carriers to the FSRU is similarly water-dependent as a result of the water-dependency of both the LNG carriers and the FSRU. And even if the regasification of the LNG could be reasonably completed onshore in the Long Island Sound area, (technical limitations associated with transporting LNG by pipeline from an offshore receiving terminal to an onshore regasification facility are more fully set forth in Section 2.2.7.5), the transfer from the LNG carriers to any onshore regasification facilities would also be water-dependent because such transfers would only be able to be completed in or adjacent to the Sound's waters. Such an alternative would also result in increased impacts on shore and to near shore coastal waters. For example, an onshore regasification facility would require pipeline and jetty construction and, resultingly, increased dredging, and visual impacts. Furthermore, such an alternative would still result in the FSRU being within the coastal zone and would not serve to avoid issues pertaining to the safety of Long Island's residents. Such an onshore alternative also would cause competition for and impacts to Long Island's valuable coastline.

The operations of the FSRU are similarly water-dependent because, in addition to receiving LNG from water-borne carriers, it will distribute vaporized LNG into the interconnection pipeline for delivery into the IGTS subsea pipeline. Broadwater's business of delivering vaporized LNG to the target markets, which relies upon the existing IGTS pipeline, further proves the Broadwater Project's unique needs rendering it a water-dependent use. The onshore facilities that will be used for the marine transfer of FSRU support vessels and people are water-dependent as well, thereby necessitating a location on or adjacent to the waterfront. But to avoid impacts and as further evidence of the Project's consistency with coastal policies, Broadwater will use existing, appropriate locations along the waterfront rather than constructing new facilities so as to reduce the competition for limited space on Long Island's coastline. And any onshore support facilities in Port Jefferson<sup>11</sup> will be consistent with the water-dependent

<sup>11</sup> Broadwater's water-dependent, onshore facilities may also be sited in a suitable, existing commercial location in the Village of Greenport, which, while not a designated maritime center, would be an appropriate site based on existing land use and zoning for the potential site and surrounding area. A strong reflection of the suitability of the Broadwater Project in Greenport is the support for the Project by the Mayor of Greenport.

commercial and industrial facilities that are characteristic of Long Island Sound's maritime centers.

In addition to these technical factors that confirm the Broadwater Project's water-dependency, several other considerations relating to project need, environmental impacts, and construction and operation costs of various site alternatives confirm the Project's suitability within Long Island Sound. First, energy demand in the U.S. is projected to increase at a rate that is fast outpacing supply. Natural gas demand within New York, in particular, is expected to grow well beyond its current levels over the next 15 years (*see* Resource Report No. 1, General Project Description). The growth rate for natural gas is estimated to be approximately 3.2% annually in the Broadwater Project's target markets. This growing demand is occurring at a time when domestic and North American production of natural gas has been generally flat, and projected increases in production will not keep pace with demand. It is also occurring at a time when major interstate and intrastate pipeline systems in the northeast are near or at capacity. As a result, LNG imports are becoming an increasingly critical part of the U.S. energy supply market and are projected to help offset the imbalance between domestic supply and consumer demand. Another important factor confirming the Broadwater Project's suitability and compatibility within the Sound is that the LIS CMP expressly identifies LNG facilities within the text of Policy 13. (*see* LIS CMP Policy 13.4). It is significant that the drafters of the LIS CMP singles out LNG facilities while there is little or no mention of other types of energy facilities. This specific discussion of LNG facilities confirms that the drafters contemplated and considered LNG facilities to be generically suitable uses within Long Island Sound. And while suitability of a proposed LNG facility is subject to a showing of consistency with the 13 Sound specific policies of the LIS CMP and other applicable and enforceable programs, Broadwater's submission provides overwhelming evidence that substantiates its determination that the Broadwater Project is consistent with the applicable policies of New York's CMP, including but not limited to the LIS CMP.

***Broadwater's Offshore Location Outside a Maritime Center is Appropriate***

Maritime centers are those areas recognized as special coastal areas that are developed with and particularly well-suited for water-dependent commercial and industrial uses or essential support facilities. Port Jefferson Harbor is among the coastal communities that have been identified as a Long Island Sound maritime center. Maritime centers are "the most suitable and appropriate locations on the Sound coast for expansion of existing, or the development of new, water-dependent commercial and industrial uses." LIS CMP at 98. While LIS CMP Policy 10 states that maritime centers are to be promoted as the most suitable locations for water-dependent uses, the policy also recognizes that, in certain instances, siting a water-dependent use outside the maritime center is acceptable and must be allowed. In addition, it is unclear whether the LIS CMP's promotion of such uses in Maritime Centers was in comparison to other onshore (as opposed to offshore) locations.

Aspects of the Broadwater Project will be located outside of a maritime center. This location is nonetheless consistent with LIS CMP Policy 10. There are numerous reasons why the Broadwater Project is an example of a project where siting outside a maritime center is appropriate, necessary, and consistent with the LIS CMP. The explanation provided in LIS CMP subpolicy 10.3 states "[n]ew water-dependent uses may be appropriate outside maritime centers if the use: (1) should not be located in a maritime center due to the lack of suitable sites; or (2) has unique locational requirements that necessitate its location outside maritime centers; or (3) would adversely impact the functioning and character of the maritime center if located within the maritime center; or (4) is of a small scale and has a principal purpose of providing access to coastal waters." The satisfaction of any one of these factors is sufficient to support locating a water-dependent use outside a maritime center. Here, the Broadwater Project satisfies three (1-3) of the four prongs and therefore falls within the exceptions to siting within a maritime center.

The FSRU is properly sited outside of a maritime center because such location is the most preferable location and onshore alternatives are not feasible.<sup>12</sup> That is, an onshore location for the FSRU on Long Island is so imprudent and antithetical to generally accepted engineering and planning principles that it must be rejected. As such, the offshore location for the Broadwater Project meets the LIS CMP Policy 10 standard for siting outside a maritime center. From a technical standpoint, an onshore location for Broadwater's storage and regasification facilities would create significant engineering and logistical barriers. As is discussed in Section 2.2 above, the feasibility of such onshore facilities would be largely dependent upon their proximity to the coast due to distance considerations for LNG transfer piping (e.g., temperature and pressure maintenance, and steel piping thermal expansion). In addition, siting the proposed Broadwater Project in a maritime center would result in significantly greater environmental impacts to Long Island Sound's on- and near-shore natural resources, due to the need for additional infrastructure to accommodate LNG carriers or to support onshore storage and regasification operations. Examples of potential impacts that could result from an onshore, maritime center alternative include those associated with the construction of a jetty (e.g., extensive near-shore dredging) for access to a moored LNG receiving terminal or

<sup>12</sup> Feasible includes the concepts of capable of being done, prudence, and meeting generally accepted engineering and planning practices.



to provide access between the LNG carrier and any onshore regasification unit or onshore storage tanks.

Another consideration that strongly weighs in favor of Broadwater's proposed offshore FSRU location is the population density of Long Island Sound's coastal communities. In 2004, the estimated population of Suffolk County was 1,475,488. Even assuming that there was a technically feasible, onshore site within a distance over which it would be feasible to pipe LNG, the dense population of Long Island Sound's coastal communities effectively eliminates an onshore, coastal siting location based on safety and security issues. The selected Broadwater Project location would have the lowest population living within 1 mile and 10 miles of the LNG terminal as compared to the other existing on shore LNG terminals in the United States. As such, the proposed, offshore location is by far the most conservative when considering potential safety and security issues for Long Island's residents and tourists and consistency with applicable coastal zone policies. **This is consistent with the Coast Guard's findings in the WSR that the proposed location of the FSRU has a number of significant safety and security benefits when compared to those in other locations or using other technologies, especially with respect to the threat and consequences since it located far away from population centers. WSR §§ 5.2.2, 8.2.** Also important to consider is that an onshore, maritime center location for an LNG terminal would necessitate the imposition of on-land vapor cloud and radiation exclusion zones that would result in logistical considerations for the functioning of the maritime center.

All of these factors establish the preferability of the offshore LNG terminal in its proposed location over any potential onshore site. As such, the proposed offshore, non-maritime center location is appropriate and consistent with this policy.

#### ***The Broadwater Project Minimizes Adverse Impacts***

The Broadwater Project is consistent with this policy because its design and location will also minimize adverse impacts and result in the least impact to the Long Island Sound coastal region compared to impacts that would result from alternatives. Among other salutary aspects, the Broadwater Project will be protective of natural resources as a result of its offshore transshipment of LNG. The LNG terminal also will be located to avoid navigational channels and to minimize disruption of seasonal fisheries activities.

#### ***The Broadwater Project will Utilize Existing Coastal and Pipeline Infrastructure***

As a result of the distant, offshore location for the FSRU and the use of existing sites for its water-dependent, onshore support facilities, the Broadwater Project can utilize existing infrastructure. Onshore buildings in water front locations will provide adequate onshore infrastructure. Similarly, the existing IGTS pipeline is another example of in-place infrastructure that will be a key part of Broadwater's business. The Broadwater Project's reliance on waterborne transport for cargo and people to the FSRU -- as well as for the delivery of LNG -- is consistent with this policy. As a water-dependent use that meets a manifest energy need, the Broadwater Project is consistent with the objectives of Policy 10. For all of these reasons, Broadwater's proposed alternative advances and is consistent with this policy.



**POLICY 11:** Promote sustainable use of living marine resources in Long Island Sound.

- 11.1 Ensure the long-term maintenance and health of living marine resources.*
- 11.2 Provide for commercial and recreational use of the Sound's finfish, shellfish, crustaceans, and marine plants.*
- 11.3 Maintain and strengthen a stable commercial fishing fleet in Long Island Sound.*
- 11.4 Promote recreational use of marine resources.*
- 11.5 Promote managed harvest of shellfish originating from uncertified waters.*
- 11.6 Promote aquaculture.*

Broadwater is consistent with and furthers the objectives of this policy, because the FSRU location 9 miles off the Long Island coast will limit impairment and be respectful of the living marine resources of Long Island Sound, thereby promoting their sustainability. The Broadwater Project is consistent with the goals and objectives of this policy, since the Project will maintain the commercial and recreating public's ability to use the Sound's living marine resources, including finfish, shellfish, crustaceans, and marine plants. As is more fully detailed below, the Broadwater Project is consistent with the objectives of this policy.

***The Broadwater Project Is Respectful of Marine Resources, Including Shellfish, Finfish, Crustaceans and Marine Plants***

Broadwater's distant, offshore location in the central portion of the Sound avoids inshore areas that are critical to the Sound's shellfishing industry. To protect the most sensitive nearshore resources in the Sound, the Project has been designed to avoid shore crossings so that coastal and nearshore habitats and shellfish beds will not be affected. These inshore areas are also critical to the Sound's finfishery, providing spawning and nursery habitat. As part of its coastal zone consistency evaluation and suitability assessment for siting the LNG terminal in its preferred location, Broadwater completed a review of the Poletti ichthyoplankton (IP) program data and additional IP sampling to verify the Poletti data findings. The data confirms that higher IP concentrations are located in the shallower depths of the Sound, consistent with the value of these inshore areas as spawning and nursery habitat for finfishery and providing beds for shellfish and crustaceans as well. While some loss of commercial fishing may be unavoidable from implementation of the Project, Broadwater is committed to compensating fishermen for demonstrated loss of income as a result of the Project. Through consultations with local fishing groups and regulatory agencies, Broadwater has identified several mitigation measures to address potential impacts on Long Island Sound's living marine resources and related economics, such as the commercial fishing industry. In addressing these considerations, the positive environmental, (e.g., natural gas fuel) economic, and energy benefits from the Project to the area are harmonized with the interests of the commercial fishing industry.

***The Broadwater Project Will Permit Continued Recreational Use of the Sound's Marine Resources***

Recreational fishing is a recognized beneficial use of the Sound. Broadwater has sited the FSRU in the central portion of the Sound, where field surveys have demonstrated that the bottom is largely flat and comprised of a homogenous silty clay substrate. There are no

evident bottom features that would indicate a high concentration of recreational fish species. On-water surveys during high-use periods demonstrated that the central portion of the Sound is not highly used by recreational fisherman, who tend to congregate in areas with greater bottom relief and structure that provide higher quality habitat.

The Broadwater Project will be installed to avoid use conflicts with water-dependent and water-enhanced recreation as well as conflicts/impacts on the Sound's living marine resources. FSRU installation and pipeline construction will occur from November through March. This schedule was chosen to minimize adverse impacts on Long Island Sound fisheries and habitat and to ensure that Project activities do not interfere with population and habitat maintenance and restoration efforts.

The Broadwater Project and its associated subsea pipeline are also protective of marine resources as they will not divert, restrict, or alter water circulation and sedimentation patterns and transport. Installation of the FSRU mooring system and pipeline may result in short-term impacts, including re-suspension of marine sediments, process water discharges, and disturbance to marine species and EFH, all of which are contributing factors to the commercial and recreational viability of Long Island Sound. To minimize suspension of bottom sediments, plowing will be used to the extent possible to install the pipeline. Because plowing does not fluidize bottom sediments, sediment suspension is anticipated to be minimal. The pipeline will be installed so as to not create a barrier that prevents the migration of marine species on the seafloor. This will minimize impacts on the local ecosystem and allow for quicker recovery following installation of the pipeline. Mooring system and pipeline installation activities will have short-term effects to benthos by disturbing benthic invertebrates directly beneath the pipeline and mooring system. The impacts will be highly localized; it is not anticipated that placement of the pipeline will alter the benthic community outside the footprint of the mooring tower and pipeline trench. Construction techniques will be employed so that benthic communities may become reestablished in the shortest time possible. While the use of water will result in some unavoidable impingement and entrainment of planktonic eggs and larvae, the impact from the operation of the FSRU will not be significant. There will be no appreciable impact to the Sound's fishery because the FSRU will be located in the center of the Sound, away from the shallow, highly-productive estuarine shorelines. In addition, intakes will occur at mid-water depths, limiting the species that will be impacted. Impacts to the Sound's fishery will also be limited because the volume of water intake that may result in impingement and entrainment over any given period is insignificant relative to the total volume of the water available in the Sound and given the frequency of flushing/water turnover that occurs due to the proximity of the Sound to the Atlantic Ocean. To minimize impacts on water quality and marine species, water from Long Island Sound will be used for hydrostatic testing. An approved biocide may be added to reduce algal growth, if necessary. Once hydrostatic testing has been completed, the water will be tested and, if required, treated before being discharged into the Sound.

For all these reasons, the Broadwater Project is consistent with the policy.

**POLICY 12:** *Protect agricultural lands in the eastern Suffolk County portion of Long Island Sound's coastal area.*

- 12.1 Protect existing agriculture and agricultural lands from conversion to other land uses.*
- 12.1 Establish and maintain favorable conditions which support existing or promote new coastal agricultural production.*
- 12.1 Minimize adverse impacts on agriculture from unavoidable conversion of agricultural land.*
- 12.1 Preserve scenic and open space values associated with the Sound's agricultural lands.*

The Broadwater Project will not impact the agricultural lands in the eastern Suffolk County portion of Long Island Sound's coastal area. First, the LNG terminal's siting location 9 miles off the Sound's coastline will not at all impact the Sound's existing onshore agricultural lands. Second, the onshore facilities associated with the Broadwater Project will be located in already existing sites that are commercially/industrially zoned and, thus, will not compete with Suffolk County's agricultural lands or open spaces. As such, this policy will not be applicable to the Broadwater Project.

**POLICY 13:** *Promote appropriate use and development of energy and mineral resources.*

- 13.1 *Conserve energy resources.*
- 13.2 *Promote alternative energy sources that are self-sustaining, including solar and wind powered energy generation.*
- 13.3 *Ensure maximum efficiency and minimum adverse environmental impact when siting major energy generating facilities.*
- 13.4 *Minimize adverse impacts from fuel storage facilities.*
- 13.5 *Minimize adverse impacts associated with mineral extraction.*

The very purpose and design of the Broadwater Project, which will introduce not merely supporting infrastructure but a much needed new economical energy supply into the region, is consistent with and furthers the objectives of this policy. Significantly, it is important to note at the outset that this policy expressly recognizes that LNG facilities -- such as the Broadwater Project -- are among the types of energy facilities that are suitable for and will potentially be sited in Long Island Sound. LIS CMP Policy 13.4, which calls for the minimization of impacts from fuel storage facilities, states that "Liquefied Natural Gas facilities must be safety sited and operated." LIS CMP Policy 13.4. From the plain language of this LIS CMP policy, it is clear that LNG facilities are contemplated as a potentially suitable and appropriate use within Long Island Sound, subject to, among other things, a demonstration of consistency with applicable and enforceable coastal management programs. (See also Broadwater's response to LIS CMP Policy 10, above). Here, Broadwater's business -- the receipt of LNG at the FSRU for vaporization into natural gas and the delivery of the resulting natural gas to the subsea IGTS pipeline and into the target markets -- provides a compelling proposal that will benefit the Region with the introduction of a stable supply of competitively priced natural gas. The Broadwater Project, if approved, will introduce into the Region a new supply of fuel that is cleaner-burning than and competitively priced with other fuels that are presently used to power homes, schools, hospitals, businesses, and industry in the Long Island Sound coastal area. In addition to the resulting direct and indirect economic benefits of the Broadwater Project, this new supply of natural gas will also provide a source of energy that can be used to support repowering of existing power generation facilities. Repowering of existing power generation facilities in the Region would yield substantial environmental benefits, particularly relative to existing air quality in and around the Long Island Sound coastal area -- and beyond. (See Appendix C -- Air Quality). For these reasons, and those that are more fully discussed below, the proposed Broadwater Project is appropriate for Long Island Sound.

It is well documented that the Northeast United States, including Long Island and Connecticut, need access to additional natural gas resources to meet the region's future energy demand and to offset the increase in the price of natural gas associated with unmet demand. The data regarding current energy demands and anticipated growth in the NEEC demonstrates that the target markets' energy supply is and will continue to be profoundly under sourced unless there are new sources of energy introduced to the region. The NEEC region currently accounts for 14 percent of the total gas use in the U.S. and Canada. Within the NEEC markets, the Long Island, New York City, and Southern Connecticut regions consume approximately 20 percent of the total gas consumption at an estimated 700 bcf per year. For example, in 2004, the demand of the NEEC markets was 3.5 trillion cubic feet (tcf) per year. By 2015, well-regarded Energy and

Environmental Analysis, Inc. (EEA) estimates that figure will grow to 4.7 tcf. In the Long Island, New York City, New York City Metropolitan, and Southern Connecticut region, EEA estimates that the average daily demand will grow from 1.8 bcfd in 2005 to 2.6 bcfd in 2025.

The peak daily demand in the Long Island, New York City and New York City metropolitan region and Southern Connecticut region was 3.3 bcfd in 2005 and is expected to be 4.6 bcfd in 2025. Historically, the majority of natural gas consumption has been in the residential and commercial sectors, using 37% and 18% of the available gas supply respectively. Most recently, the power generation sector has become the largest consuming sector in the area, with a 2004 consumption rate of 39% of total gas supply. From 1995-2004, the growth rate for gas consumption within the power sector was 5.6%. Notably, EEA's study reveals that gas consumption in the industrial sector is not a significant factor within the market, accounting for only 6% of the 2004 total supply in the Long Island, New York, and Southern Connecticut markets. In the past two years, prices in the NEEC have averaged in excess of \$6 MMBtu. New York City (and New England) prices are the highest within the region, nearing \$7/MMBtu on average. The introduction of LNG directly into the NEEC markets, and more particularly, the target markets of the Broadwater Project, should reduce the basis premiums that result from transporting LNG from distant regions and the lack of adequate storage capacity once LNG arrives in NEEC markets. Resulting reductions in energy costs will benefit residential consumers as well as businesses, hospitals, and school districts that use natural gas to heat buildings.

Eighty-five percent of NEEC's gas supply is delivered from long haul pipelines from the U.S. Gulf Coast (and western Canada). The Broadwater Project will increase regional reliability and energy security and reduce price volatility by bringing the energy source directly to the region. The reliability of the energy source within the region is a key factor that demonstrates the need for the Broadwater Project. 20,000 MW of new gas-fired capacity have been added in the NEEC region since 1998. And, in the New York City metropolitan region, 90% of power generation facilities use natural gas as a primary or secondary fuel. With the Broadwater Project, there will be increased delivery and receipt of economical fuel sources more directly to their target markets, reducing the likelihood of fluctuating availability during times of significant need (e.g., periods of extremely cold weather). In particular, the proposed Broadwater Project will increase both gas supply and capability to the region, particularly the New York City market. Presently, the New York City contracted pipeline capacity is 3.2 bcfd. With the Broadwater Project, delivery capability will increase by approximately 30%.

In light of the well-documented projected energy shortages within the Long Island Sound coastal area, and the New York City, and New York City metropolitan markets, there is a demonstrated need for the Broadwater Project. The Broadwater Project will provide new molecules of natural gas to the region without the environmental impacts associated with construction of a large onshore energy terminal or additional onshore pipeline infrastructure.

### ***The Broadwater Project Minimizes Adverse Impacts to the Coastal Areas of the Sound***

A site selection process was initiated in 2002 by analyzing alternatives to increase natural gas supplies to the area. Offshore areas that were considered included Block Island Sound, the Atlantic Ocean south of Long Island, as well as several areas within Long Island Sound. The preferred location was identified through a tiered screening process based on the

development and application of exclusion and preference criteria. The criteria considered included, among others, the following factors: weather; marine traffic conditions; proximity to major shipping lanes; proximity to densely populated areas; distance to existing pipeline infrastructure; location in State of New York waters; maintenance of an adequate safety buffer zone; minimum water depth of 66 feet (20 m); sensitive marine habitats and species; and geology and sediments.

The Broadwater Project is consistent with this policy's objectives to minimize adverse impacts from fuel storage facilities. The offshore FSRU location is the most viable and environmentally sound alternative when compared to those in other locations or using other technologies because:

- It is isolated outside ~~the of main~~ shipping lane ~~buffer~~route areas, thereby ensuring a safe distance between the FSRU and transiting commercial traffic; WSR § 3.1.2.1.
- It poses the least amount of conflict with respect to other water-dependent commercial and recreational uses, including commercial and recreational fishing, existing vessel traffic transiting to and from New York's Ports, and recreational boating in Long Island Sound;
- It is in proximity to an existing pipeline that is adequately sized to accept natural gas to be delivered from the FSRU, thereby minimizing the need for new pipeline facilities;
- ~~It poses the least conflict with respect to other water dependent commercial and recreational uses, including commercial and recreational fishing, existing vessel traffic transiting to and from New York's Ports, and recreational boating in Long Island Sound;~~
- The Project avoids sensitive marine habitats, such as near shore shellfish habitats;
- It requires less seafloor area for mooring purposes than a gravity-based system (GBS);
- The FSRU provides a ship-like appearance consistent with the current visual canvas of the Sound;
- The FSRU ensures continual rather than intermittent supply of natural gas to the region because of its storage capabilities;
- The FSRU in its preferred location requires less ocean surface than an alternative using Shuttle Regasification Vessel (SRV) located off the Atlantic Coast of the Sound;
- Weather and marine related conditions in Block Island Sound and the Atlantic Ocean would result in significant periods when LNG carriers would be unable to unload cargo due to excessive relative motion between the vessel and the berth. This downtime would effectively compromise supply reliability and decrease viability;

- A significantly longer pipeline crossing Long Island Sound and/or an onshore pipeline and associated shore crossing sited across Long Island potentially would be required for any site in the Block Island Sound and Atlantic Ocean area, which would result in greater environmental impacts to the Long Island Sound seabed than the FSRU in its proposed location;

- The subsea interconnect with existing IGTS subsea pipeline eliminates the impacts of a pipeline shore crossing; and
- At the end of its useful life, the FSRU can be detached from mooring and towed away. This results in significantly less environmental impact than decommissioning a GBS.

Resource Report No. 10, Alternatives, provides further details on the alternatives and site selection analysis.

Decommissioning of the terminal following its useful lifespan will not result in any permanent impacts on the environment or waterfront lands because of the ease with which the FSRU can be disconnected from its mooring and moved. The remaining mooring tower could be removed or, alternatively, left in place and converted to aid navigation within the Sound. (see Resource Report No. 1, General Project Description at 1-80). Because major aspects of the Broadwater Project, including the FSRU, will be removed after its useful life, the impacts associated with the Project are temporary, reversible, and of relatively limited duration.

### ***The Broadwater Project Will Be Safely Located and Operated***

Significantly, the Broadwater Project will be safely sited and operated. Broadwater is committed to ensuring the safety of the residents, users, and natural resources of Long Island Sound. And the members of the Broadwater Project have deep experience in all aspects of the Project. The potential impacts of the storage of LNG are minimized with the preferred FSRU alternative in the preferred location, because the stored LNG will be 9 miles off the densely populated Long Island coastline. Thus, substantial safety concerns for Long Island's residents as a result of the Project are unfounded: **and the risk evaluations in the WSR demonstrate this point. See WSR § 1.4.4.** Similarly, the distant, offshore location coupled with establishment of the **expected Coast Guard recommended** safety and security zone around the FSRU and LNG carriers traversing the Sound to and from the LNG terminal will afford protection and security to other users of the Sound, including commercial and recreational fishermen and boaters, and vessel use traffic within the Sound. There will be a minimal potential risk of ignition of an LNG carrier while in transit or moored at the FSRU that could potentially cause a threat to Long Island Sound's ecosystems. The LNG carriers will be constructed to meet all U.S. and international standards and, when at port, safety and precautionary zones will be enforced. The Project is being designed with many levels of spill prevention in place to avoid an LNG spill.

Broadwater has also completed a safety and reliability assessment to address potential disaster scenarios that could impact coastal resources. Potential hazards evaluated by Broadwater include pool fires, flammable vapor clouds, and rapid-phase transition, in addition to terrorist-related threats to shipments and LNG vessels. Multiple levels of safety will be in place to prevent problems from escalating beyond the immediate area, including radar and positioning systems to alert crew to traffic and other hazards around the vessel; primary and secondary barriers on storage tanks to prevent leakage or rupture; leak detection and mitigation through continual monitoring and emergency shutdown procedures; and establishment of a safety zone that extends beyond the FSRU and carriers. Further information about the results of Broadwater's safety and reliability assessment are contained in Resource Report No. 11, Safety and Reliability.



In addition, as part of the WSR, the Coast Guard developed Hazard Zones to assess the potential risks associated with a large spill of LNG into the water. WSR § 1.4 The Coast Guard looked to the criteria used by Sandia National Labs in their report, *Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water* (December 2004), to develop the three hazard zones and then used the hazard zones to assess the potential risks associated with the Project. WSR § 1.4.1.

Within the three zones, the level of risk reduces with an increasing distance from the source. For Zones 1 and 2, the outer limits are defined as the thermal radiation impacts (high potential or potential for major injuries or damage) that could be expected from an intense LNG vapor fire. Id. The outer limit of Zone 3 is based on the lower flammability limit of LNG vapor (i.e., the point at which a vapor cloud would disperse that it cannot be ignited). Id.

#### Summary of Waterways Suitability Report Findings

The primary difference between the evaluations contained in the Sandia Report and those in the WSR relate to differences between the size of the LNG carriers considered by Sandia and those proposed by Broadwater. The size of the three hazard zones reported in the Sandia Report were based on large releases of LNG from LNG carriers with a capacity of 138,000-144,000 m<sup>3</sup>. The individual tank capacities were approximately 25,000 m<sup>3</sup>. The Sandia study assumed that about one-half of the tank volume was released, or 12,500 m<sup>3</sup>. *Sandia National Laboratories Report SAND2004-6258: Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water*, 2004, p. 141.

By way of contrast, the tank sizes for the FSRU and the maximum proposed LNG carrier size for the project (250,000 m<sup>3</sup>) are somewhat larger (approximately 42,000 to 45,000 m<sup>3</sup>) and therefore the volume of a potential release and the subsequent hazard zones will be somewhat larger than those estimated in the Sandia Report. WSR § 1.4.4.

The Federal Regulatory Energy Commission (FERC) conducted the consequence assessment for the WSR and conservatively determined that for the FSRU and the LNG carriers each of Zones 1 and 2 should be approximately 32 to 35% or 16 to 18% respectively larger than those established in the Sandia Report to account for larger potential spill volumes from the Project. Id.

The results of the Coast Guard's assessment conclude that because the FSRU is located in the central Sound none of Hazard Zones 1, 2 or 3 would overlap any portion of land. It was also concluded that no land areas along the LNG carrier transit route would fall within Hazard Zones 1 or 2. WSR §3.2.

Hazard Zone 3, which carries the least level of risk and conservatively extends out to 4.3 miles from the moving LNG carrier, would overlap the following land areas:

- Northern tip of Block Island, Rhode Island;

- Southern tip of Weekapaug Point, Westerly, Rhode Island;
- Southern tip of Watch Hill, Rhode Island;
- All of Fisher's Island, New York;
- All of Plum Island, New York;
- Northernmost third of the North Ford of eastern Long Island; and
- A portion of Goshen Point straddling the City of New London and the town of Waterford.

Id.

### Hazard Zone 3 Discussion

A further discussion of Hazard Zone 3 is appropriate. The analysis of this hazard zone followed the guidance provided in the Sandia Report for an intentional breach scenario. It should be noted that this assessment considers only the *consequence* of such a breach scenario, and does not consider the *probability* of occurrence of such a scenario. The Sandia Report's analysis made the following assumptions:

- A 5 m<sup>2</sup> hole size. This is a hole approximately 8 feet in diameter in a double-hulled LNG carrier. In the course of the Coast Guard's review, Broadwater submitted an evaluation of design data from different sized LNG carriers showing that larger future generation LNG carriers and the FSRU will have thicker inner and outer hull plate thickness and a larger horizontal distance between the outer and inner hulls compared to smaller LNG carriers currently in service, rendering large carriers less vulnerable to hull damage. This is therefore a conservative assumption. *Det Norkse Veritas for Broadwater Energy - Response to U.S. Coast Guard Letter Dated December 21, 2005, Report No. 70014347, February 13, 2006, pp. 2-5.*
- Intentional breach of 3 separate tanks.
- No ignition when the breach occurs. This is a conservative assumption, as the Sandia Report states: "*Most of the intentional damage scenarios identified produce an ignition source such that an LNG fire is likely to occur immediately.*" *Sandia Report, p. 73.* If the breach is ignited, the smaller Hazard Zones 1 and 2 are applicable.
- Calm atmospheric conditions, allowing the maximum drift of the vapor cloud. If the atmospheric conditions are less stable, the LNG vapor cloud will disperse more quickly and the extent of the vapor cloud will be reduced. Based on a review of annual average data for 1994 to 2004 by Broadwater, it was determined that the stable atmospheric conditions assumed in the Sandia Report only occur about 15% of the time.

The high degree of conservatism in this scenario is acknowledged in the Sandia Report, which states:

While previous studies have addressed the vapor dispersion issue from a consequence standpoint only, the risk analysis performed as part of this study indicates the potential for a large vapor dispersion from an intentional breach is highly unlikely. This is due to the high probability that an ignition source will be available for many of the initiating events identified, and because certain risk reduction techniques can be applied to prevent or mitigate the initiating events identified. Sandia Report, p. 53.

Similar conclusions pertain to the application of this intentional breach scenario to the Broadwater Project.

#### Summary of Potential Coastal Zone Effects

In conclusion, while the WSR assessed an intentional breach scenario that was generally consistent with that outlined in the Sandia Report, the potential for Hazard Zone 3 to impact land along the LNG carrier route is highly unlikely, due to the following:

- (1) The unlikely occurrence of the simultaneous intentional breach of three tanks without any spark that would cause ignition.
- (2) The limited occurrence of stable (F stability class) atmospheric conditions in Long Island Sound.
- (3) The established safety record of LNG carriers: "Over the approximately 45 years since the first marine shipment of LNG, more than 33,000 LNG carrier voyages have taken place. Transport of LNG in vessels has an excellent safety record: only eight marine incidents worldwide have resulted in LNG spills, some with damage. No cargo fires have occurred." WSR § 3.1.4.
- (4) The lack of credible terrorist threats against the facility. The WSR notes that "There are no known, credible threats against the proposed Broadwater Energy facility." WSR § 8.2.
- (5) The unlikelihood of the facility being considered a terrorist target, as noted by the Coast Guard in the WSR:

"The current threat environment indicates a primary factor in the selection of targets by a terrorist organization such as al-Qa'ida is whether an attack could result in a significant loss of life. Another factor is that the target is readily accessible to the media so that the images of the attack can be quickly seen throughout the country and the world."

"There would normally be between 30 and 60 persons on the FSRU and between 20-25 crewmembers on an LNG carrier. While an attack against the FSRU or an LNG carrier would possibly result in loss of life, the proposed location is sufficiently remote that hazards Zones 1, 2, or 3 would not affect shoreside population centers. Second, the proposed location of the FSRU

*is relatively remote given the distance from shore and would not be broadly and readily accessible to the media or public. Based on the above two criteria, the Broadwater Energy FSRU would more than likely not be an attractive terrorist target."* WSR § 5.2.1.

In sum, the design and siting location of the LNG terminal for the Broadwater Project will advance the objectives of promoting the use and development of energy resources and protecting and maintaining the coast's environmental resources that are at the heart of Policy 13. Furthermore, LNG facilities are expressly contemplated among the types of energy facilities that are suitable for and will potentially be sited in the Long Island Sound coastal area. The Broadwater Project will provide a new source of energy to the target markets where conservation measures alone are insufficient to address the rapidly growing demand. In addition, the Broadwater Project further satisfies the policy's objective of reducing dependence on imported oil for electric generation and home heating, by introducing a new, cleaner-burning and competitively-priced energy source, LNG, in a region in which it is largely unobtainable.

## 4.2 Applicable Local Waterfront Revitalization Plans<sup>13</sup>

### 4.2.1 Town of Southold LWRP

The Town of Southold is located at the extreme eastern end of Long Island, at the northern end of the peninsula known as North Fork. The entire Town, including Fishers, Plum and Robins Islands (in total there are five islands located within the jurisdiction of the Town), contain approximately 163 linear miles of coastline, with multiple harbor areas. The Town is never wider than 1.25 miles.

The mainland is mostly level or gently sloping; while the Long Island shoreline is characterized by steep bluffs and backed by wooded hills, giving way to land that gently slopes to the marshes and wetlands of the Peconic Estuary shoreline to the south. The Town is surrounded by the marine waters of Long Island Sound, Fishers Island Sound, Block Island Sound, Gardiners Bay, and the bays of the Peconic Estuary.

Broadwater has identified two onshore locations on Long Island that can provide the facilities needed to support the operation of the Broadwater Project, including a waterfront site in the Village of Greenport and a waterfront site in the Village of Port Jefferson. Although the Village of Greenport is an incorporated village within the Town of Southold, it is a separate governmental entity with its own approved-LWRP and, as such, Broadwater has addressed consistency of the Project's onshore facilities with the Village of Greenport's LWRP.

The Town of Southold has a DOS-approved LWRP, which received a concurrence determination from the OCRM (part of the NOAA's National Ocean Service

<sup>13</sup> Broadwater submits this consistency determination subject to and without waiver of any rights that Broadwater has or may have relative to the applicability or non-applicability of NYSDOS- and federally-approved LWRPs to the FSRU/YMS and interconnected pipeline because, *inter alia*, these offshore facilities are outside the regulatory boundaries for any approved LWRP due, among other things, to their location in the central portion of Long Island Sound, a minimum of 9 miles from the coast.

program) in November 2005. Broadwater's coastal zone consistency analysis addresses this federally- and DOS-approved LWRP. The Town of Southold's LWRP follows and further refines the 13 coastal policies in the LIS CMP in an attempt to reflect the Town's local needs.

The Town has also incorporated a generic HMP in the LWRP. The HMP addresses waterside issues from a point extending seaward to the land. The waterside boundary of the Southold Harbor Management Area extends from the mean high water mark seaward, as defined in Southold LWRP Section I, Harbor Management Area Boundary at I-6 and Section IV - Harbor Management at IV-1 to IV-3. The landward side of the waterside boundary of the Southold HMP runs to the joint boundary between the Village of Greenport and the Town of Southold. (See Southold LWRP, Section I, Boundary at I-7).

Although Broadwater respectfully maintains that consistency with the Southold LWRP for the FSRU/YMS, the interconnection pipeline, and the onshore facilities is inapt because the facilities are outside the Southold coastal and waterside boundary, Broadwater has prepared an explicit evaluation of the Broadwater Project's consistency with the Southold LWRP. As Broadwater demonstrates in this submission, the Broadwater Project is consistent with and complies with the Southold LWRP as well as all of the LIS CMP and State CMP policies.

#### **4.2.1.1 History of the Town of Southold Waterfront**

The Town of Southold, officially founded in 1640, is considered the oldest English settlement New York State. The first settlers raised crops and, as more land became available, the Peconic Estuary became a center for shipping and shipbuilding. Other important industries during that time were pottery and brickmaking, which continued until the 1938 hurricane flooded the clay pits.

In the first half of the nineteenth century, Southold remained relatively isolated, although many vessels made port there. Grain, produce, cattle, and bricks were shipped to New England and upstate markets and later to Brooklyn and New York City. In 1856, the Southold wharf was built.

When the Village of Greenport was officially incorporated in 1838, shipbuilding and shipping was gradually transferred from Southold to Greenport. With the advent of the railroad in 1844, the Town changed and the sense of isolation ended as distant markets were brought close. Land values rose, farming methods modernized and the Town flourished. A more diversified economy was established, bringing in tourism. Southold, however, still remained largely an agricultural community.

The end of World War II brought more changes to Southold as the shipbuilding industry declined and improved modes of transportation and communication resulted in more rapid change and development.

Southold's economy has been based on three areas of activity: agriculture, maritime industries and tourism/recreation. The tourism/recreation sector of the economy is attributed to summer residents, vacationers and day-trippers seeking out the Town for its farms, beaches, water and land based recreational activities, and for its visual landscape. While

farmland still dominates the landward vista and is the dominant visual feature, marine waters surround that landscape. The maritime industries comprise a wide range of businesses, from baymen and commercial fisherman, to marinas that provide services for recreational boaters and fishermen. The primary focus of the Southold LWRP is on-water dependent and water-enhanced-uses.

#### 4.2.1.2 Consistency with Town of Southold Local Waterfront Revitalization Plan (LWRP)

**POLICY 1:** *Foster a pattern of development in the Town of Southold that enhances community character, preserves open space, makes efficient use of infrastructure, makes beneficial use of a coastal location, and minimizes adverse effects of development.*

This LWRP policy arguably applies only to the Southold waterfront and will not be applicable to the Broadwater Project because the Broadwater Project does not propose to construct any facilities in the coastal area boundary of the Town of Southold. (Southold LWRP, Section I-b, Boundary). Additional analysis of the issues addressed in this LWRP policy is contained in Broadwater's response to LIS CMP Policy 1, above.

For all of these reasons, the Broadwater Project is consistent with this LWRP policy.

**POLICY 2:** *Preserve historic resources of the Town of Southold.*

- 2.1 *Maximize preservation and retention of historic resources.*
- 2.2 *Protect and preserve archaeological resources.*
- 2.3 *Protect and enhance resources that are significant to the coastal culture of the Long Island Sound.*

This LWRP policy arguably applies exclusively to the Town of Southold waterfront and will not be applicable to the Broadwater Project because the on and offshore facilities will be outside the Southold coastal boundary. Additional analysis of the issues addressed in this LWRP policy is contained in Broadwater's response to LIS CMP Policy 2, above. See also Section 3.4 for a discussion of historic, cultural, and archaeologic resources.

For all of these reasons, the Broadwater Project is consistent with this LWRP policy.

**POLICY 3:** *Enhance visual quality and protect scenic resources throughout the Town of Southold.*

- 3.1 *Enhance visual quality and protect scenic resources throughout the Town of Southold.*

The Broadwater Project is consistent with this LWRP policy because the Broadwater Project is protective of scenic resources throughout the Town of Southold. The Southold LWRP recognizes the importance of the visual quality of the coastal waterfront as a

resource that has an economic and an aesthetic impact, and that the Town's visual character contributes to its reputation as a quality waterfront community. The Southold LWRP places high value on preserving the differing landforms, highly scenic natural resources, and cultural resources to continue to Southold's "attraction and vitality as a year-round waterfront community." (Southold LWRP, Section III, Policies at 6).

To meet the goals of this policy, the Town has listed some of the following standards: minimizing the introduction of design components that would be discordant with existing natural scenic components and character; restoring deteriorated and removing degrading visual components; screening components of development; using appropriate siting, scales, forms and materials to ensure compatibility; protecting the visual interest provided by active water-dependent uses; and protecting visual quality associated with public lands by limiting water surface coverage or intrusion to the minimum amount necessary. (*see* Southold LWRP, Section III, Policies at 7).

The Broadwater Project is consistent with already visible views. For example, views from roads and public parks within the Town of Southold are "extensive and varied." Typical views include sights of harbor centers, Long Island Sound, and Orient Harbor, among others. While agriculture and open land is a strong component of the visual character of Southold, maritime views and activities also contribute to the visual quality of Southold and its sense of character.

As is noted in Broadwater's response to LIS CMP Policy 3, Broadwater has taken extensive measures in the design, coloration, configuration, and siting of the FSRU to protect the scenic resources within the Sound. Broadwater has also considered the potentially sensitive visual resources and vantage points within the Town of Southold as part of its December 5, 2005 completed VRA. (*see* VRA, Appendix K). In fact, Broadwater evaluated the potential visibility of the FSRU from twelve potentially visually sensitive receptors in the Town of Southold. The FSRU will not be at all visible from the Eastern Long Island Campground or the Mattituck Inlet Marina. (viewpoint [VP] LI01 and LI12, respectively). In addition, while the FSRU may be visible from other receptors in the Town of Southold, its visibility is limited largely as a result of its offshore location. In fact, in each instance, the FSRU will be at least 16 miles from potentially visible locations within the Southold coastal boundary. Broadwater has compiled photo simulations from multiple potentially sensitive receptor locations that depict the existing condition (i.e., without the Broadwater Project) and the proposed condition (i.e., with the Broadwater Project). These photo simulations are included as part of Broadwater's VRA. In particular, Broadwater completed photo simulations for Inlet Pond County Park (24.2 miles from FSRU) (*see* Appendix K, Figures A-3A, A-3B, A-3C (VP-LI01); Horton Point Lighthouse (20.9 miles from FSRU) (Appendix K, Figures A-4A, A-4B, A-4C (VP-LI04); and Breakwater Beach (15.9 miles from FSRU) (Appendix K, Figures A-5A, A-5B, A-5C (VP-LI11)). These photo simulations confirm that the Broadwater Project will be consistent with features that already exist in Southold's view shed and will not create an unusually discordant feature on the Sound.

The presence of the FSRU and LNG carriers may diminish the aesthetic experience for those who believe that the Sound should be used strictly for recreational purposes. However, for those who recognize and understand that the Sound is a multi-purpose water body, the presence of the FSRU and LNG carriers will have little impact on their recreational experience, as these features are consistent with already existing facilities and vessels on the



Sound. The ConocoPhillips Northville petroleum terminal and the Shoreham Energy Center (formerly the Shoreham Nuclear facility) are just two examples of such facilities. Similarly, vessels are already commonly-used for waterborne transportation within the Sound. **This is confirmed in the WSR which categorizes the entire transit route that LNG carriers would traverse as a multiple use waterway. WSR §§ 2, 2.2, 2.2.1, 3.2 and 8.2. In fact, numerous large vessels operate routinely on LIS. WSR § 2.2.1.1. The WSR states that deep draft vessels transiting LIS range in size from 500 to 902 feet in length and that those in excess of 800 feet in length generally carry petroleum or coal. Id.** As such, LNG carriers will be consistent with existing features and will even present a point of visual interest for many observers.

For all of these reasons and those set forth in Broadwater's response to LIS CMP Policy 3 and the VRA, Broadwater is consistent with the objectives of this LWRP policy.

- POLICY 4:** *Minimize loss of life, structures, and natural resources from flooding and erosion.*
- 4.1 *Minimize losses of human life and structures from flooding and erosion hazards.*
  - 4.2 *Protect and restore natural protective features.*
  - 4.3 *Protect public lands and public trust lands and use of these lands when undertaking all erosion or flood control projects.*
  - 4.4 *Manage navigation infrastructure to limit adverse impacts on coastal processes.*
  - 4.5 *Ensure that expenditure of public funds for flooding and erosion control projects results in a public benefit.*
  - 4.6 *The siting and design of projects involving substantial public expenditure should factor in the trend of rising sea levels.*

The Broadwater Project does not propose to locate any onshore facilities in Southold. Refer to Broadwater's response to LIS CMP Policy 4 above for a further discussion of compliance with this LWRP policy.

**POLICY 5:** *Protect and improve water quality and supply in the Town of Southold.*

- 5.1 *Protect direct or indirect discharges that would cause or contribute to contravention of water quality standards.*
- 5.2 *Minimize non-point pollution of coastal waters and manage activities causing non-point pollution.*
- 5.3 *Protect and enhance quality of coastal waters.*
- 5.4 *Limit the potential for adverse impacts of watershed development on water quality and quantity.*
- 5.5 *Protect and conserve the quality and quantity of potable water.*

The Broadwater Project does not propose to locate any onshore facilities in Southold. Therefore, there are no concerns about flooding or erosion due to onshore facilities. Refer to Broadwater's response to LIS CMP Policy 5 above for further discussion of the issues raised by this LWRP policy.

**POLICY 6:** *Protect and restore the quality and function of the Town of Southold's ecosystem.*

- 6.1 *Protect and restore ecological quality throughout the Town of Southold.*
- 6.2 *Protect and restore Significant Coastal Fish and Wildlife Habitats.*
- 6.3 *Protect and restore tidal and freshwater wetlands.*
- 6.4 *Protect vulnerable fish, wildlife, and plant species, and rare ecological communities.*

The Broadwater Project's facilities (i.e., the FSRU/YMS, the interconnection pipeline, and the onshore facilities) are outside Southold's coastal and waterside boundaries and thus, there are no issues regarding Broadwater's consistency with this LWRP policy. Refer to Broadwater's response to LIS CMP Policy 6 above for further discussion of the measures by which Broadwater's facilities will be in compliance with this LWRP policy.

**POLICY 7:** *Protect and improve air quality in the Town of Southold.*

- 7.1 *Control or abate existing and prevent new air pollution.*
- 7.2 *Limit discharges of atmospheric radioactive material to a level that is as low as practicable.*
- 7.3 *Limit sources of atmospheric deposition of pollutants to the Town of Southold, particularly from nitrogen sources.*

The Broadwater Project will be consistent with this LWRP policy because the introduction of a cleaner-burning energy source within the region will contribute to reduced emissions of acid rain precursors and other particulate matter. Refer to Broadwater's response to LIS CMP Policy 7 above for further discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 8:** *Minimize environmental degradation in the Town of Southold from solid waste and hazardous substances and wastes.*

- 8.1 *Manage solid waste to protect public health and control pollution.*
- 8.2 *Manage hazardous wastes to protect public health and control pollution.*
- 8.3 *Protect the environment from degradation due to toxic pollutants and substances hazardous to the environment and public health.*
- 8.4 *Prevent and remediate discharge of petroleum products.*
- 8.5 *Transport solid waste and hazardous substances and waste in a manner which protects the safety, well-being, and general welfare of the public; the environmental resources of the state; and the continued use of transportation facilities.*
- 8.6 *Site solid and hazardous waste facilities to avoid potential degradation of coastal resources.*

The Broadwater Project will be consistent with this LWRP policy. Broadwater is committed to using best management practices (BMPs) to avoid environmental degradation by minimizing discharges of solid waste and hazardous substances and waste during the construction and operation of the project. Because the Broadwater Project does not propose to locate its onshore or offshore facilities in the Town of Southold coastal boundary, and because of the multiple measures that the Broadwater Project is taking to properly handle and where possible avoid the release of solid waste and hazardous substances and wastes, Broadwater has minimized the potential for environmental degradation of Long Island Sound, including Southold. Refer to Broadwater's response to LIS CMP Policy 8 above for further discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Section 2.1.2.8.1 regarding the Broadwater Project's waste and waste handling for further discussion and analysis regarding Broadwater's compliance with this LWRP policy.

**POLICY 9:** *Provide for public access to, and recreational use of, coastal waters, public lands, and public resources of the Town of Southold*

- 9.1 *Promote appropriate and adequate physical public access and recreation to coastal resources.*
- 9.2 *Protect and provide public visual access to coastal lands and waters from public sites and transportation routes where physically practical.*
- 9.3 *Preserve the public interest in and use of lands and waters held in public trust by the state and the Town of Southold.*
- 9.4 *Assure public access to public trust lands and navigable waters.*
- 9.5 *Provide access and recreation that is compatible with natural resource values.*

The Broadwater Project is consistent with and will comply with the objectives of this LWRP policy because Broadwater will protect and preserve public access to, and recreational use of, coastal waters, public lands, and public resources of the Town of Southold. As discussed above in Broadwater's response to Southold LWRP Policy 3, Broadwater is consistent with the objectives of this LWRP policy because it protects and does not restrict

physical public visual access to coastal resources within the Sound. To the extent that the FSRU is located in navigable waters off the coast of Riverhead such that transiting LNG carriers must pass through waters off the Southold coast, the Broadwater Project will result in only limited, temporary restrictions on public access for safety and security purposes during such transit periods. Appendix J, Broadwater's LNG Carrier Route Analysis suggests that no major coastal features would be significantly impacted by the proposed LNG carrier or an associated USCG - ~~identified~~**recommended** safety and security zone. Additionally, any such limitation would only be temporary. As is discussed in Broadwater's response to LIS CMP 9 above the estimated time restriction due to the safety and security zone surrounding a transiting LNG carrier is only 15 minutes.

It is significant that this LWRP policy recognizes that while maintaining public access to the coastal resources is an important goal, there are instances where the public use may be restricted in navigable waters for "water-dependent uses involving navigation and commerce which require structures or activities in water as part of the use." (Southold LWRP, Section III-41, Policy 9.4.E.2a). In fact, this LWRP policy states that "[t]he right of commercial navigation is superior to all other uses on navigable waters and may not be obstructed." (*Id.* at III-43-44, Policy 9.4.E.3a). Broadwater's business of receiving overseas sourced LNG at the FSRU and the distribution of the LNG into the IGTS interconnection pipeline is water-dependent because it relies exclusively on waterborne transportation for the delivery of LNG and also on the existing infrastructure of the water-dependent IGTS pipeline. In other words, the Broadwater Project unquestionably relies upon waterborne commerce on the navigable waters of the Sound. Refer to Broadwater's response to LIS CMP Policy 9 above for further discussion of the Broadwater Project's compliance with this LWRP policy. *See also*, Section 3.6.3.3, above.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 10:** *Protect the Town of Southold's water-dependent uses and promote siting of new water-dependent uses in suitable locations.*

- 10.1(a) *Protect existing water-dependent uses.*
- 10.1(b) *Improve the economic viability of water-dependent uses by allowing for non-water dependent accessory and multiple uses, particularly water enhanced and maritime support services where sufficient upland exists.*
- 10.2 *Promote Mattituck Inlet and Creek, Mill Creek and the Village of Greenport as the most suitable locations for water-dependent uses within the Town of Southold.*
- 10.3 *Allow for continuation and development of water-dependent uses within the existing concentration of maritime activity in harbors, inlets and creeks.*
- 10.4 *Minimize adverse impacts of new and expanding water-dependent uses and provide for their safe operation.*
- 10.5 *Provide sufficient infrastructure for water-dependent uses.*
- 10.6 *Promote efficient harbor operation.*

The Broadwater Project does not propose to locate on or offshore facilities in the Town of Southold. Therefore, the Broadwater Project will not affect and will protect the Town of Southold's water-dependent uses. For further discussion regarding Broadwater's water-dependency and the suitability of its proposed location in the center portion of Long Island Sound, refer to Broadwater's response to LIS CMP Policy 10, above.

**POLICY 11:** *Promote sustainable use of living marine resources in Long Island Sound, the Peconic Estuary and Town waters.*

- 11.1 *Ensure the long-term maintenance and health of living marine resources.*
- 11.2 *Provide for commercial and recreational use of the Town of Southold's finfish, shellfish, crustaceans, and marine plants.*
- 11.3 *Maintain and strengthen a stable commercial fishing fleet in the Town of Southold.*
- 11.4 *Promote recreational use of marine resources.*
- 11.5 *Promote managed harvest of shellfish originating from uncertified waters.*
- 11.6 *Promote aquaculture.*

The Broadwater Project is consistent with the objectives and goals of this LWRP policy, because the placement of the FSRU in the central portion of the Sound will result in the least effects on living marine resources within Long Island Sound, including those marine resources within the Town of Southold. This is so because the FSRU is placed away from, among other things, the nearshore habitats of shellfish within the Sound. Refer to Broadwater's responses to LIS CMP Policies 6 and 11 above for further discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 12:** *Protect agricultural lands in the Town of Southold.*

- 12.1 *Protect agricultural lands from conversion to other land uses.*
- 12.2 *Establish and maintain favorable conditions which support existing or promote new coastal agricultural production.*
- 12.3 *Minimize adverse impacts on agriculture from unavoidable conversion of agricultural land.*
- 12.4 *Preserve scenic and open space values associated with the Town's agricultural lands.*

The Broadwater Project does not propose to locate onshore facilities in the Town of Southold. Therefore, the Broadwater Project will not affect agricultural lands in the Town of Southold. Refer also to Broadwater's response to LIS CMP Policy 12 above for further discussion of the issues raised by this LWRP policy.

**POLICY 13:** *Promote appropriate use and development of energy and mineral resources.*

- 13.1 *Conserve energy resources.*
- 13.2 *Promote alternative energy sources that are self-sustaining, including solar and wind powered energy generation.*
- 13.3 *Ensure maximum efficiency and minimum adverse environmental impact when siting major energy generating facilities.*
- 13.4 *Minimize adverse impacts from fuel storage facilities.*
- 13.5 *Minimize adverse impacts associated with mineral extraction.*

The Broadwater Project does not propose to locate its onshore or offshore facilities in the Town of Southold. The Broadwater Project is appropriately located in the central portion of Long Island Sound, and is sited to promote the appropriate use and development of energy resources within Long Island Sound. The Broadwater Project's selected location will not significantly affect the Town of Southold. Additionally, the objectives of this LWRP policy are identical to those set forth in LIS CMP Policy 13. Like LIS CMP Policy 13.4, this Greenport LWRP policy also plainly identifies LNG facilities as the type of LNG facilities that would be sited and suitable in the Sound. Therefore, even assuming this LWRP policy applies to the FSRU, the Broadwater Project is consistent with this LWRP policy. Refer to Broadwater's response to LIS CMP Policy 13 above for further discussion of issues raised by this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

#### **4.2.2 Village of Greenport LWRP**

The Village of Greenport is approximately one square mile located within the Town of Southold and situated on the eastern end of the North Fork of Long Island, Suffolk County. Much of the Village's development and vitality is due to its waterfront location. From the early 1830's to 1849, schooners from all over the world sailed from Greenport to Sag Harbor. In 1835, and continuing up until the mid-1900's, the menhaden (moss bunker) fishing industry had a major impact on Greenport and "fish factories" were established along the Greenport waterfront. The fish were harvested and used for their oils, as a farm fertilizer and for animal food. Also at the turn of the century, and continuing up until the early 1960's, oystering was a major industry in Greenport.

The entire Village of Greenport is within the coastal area boundary. The waterside boundary of Greenport's coastal area is the same as the Village's legal jurisdictional boundary and extends out from the shoreline into Shelter Island Sound encompassing the waters, known as Greenport Harbor, landward of the waterside boundary connecting Young's Point and Fanning Point. Greenport Harbor is composed of the deep waters off the Village Center and a shallow inland waterbody called Stirling Basin. Greenport Harbor is reached through Gardiners Bay, which opens to the Atlantic Ocean and Long Island Sound to the east.



#### 4.2.2.1 History of the Village of Greenport Waterfront

Greenport prospered as a result of the menhaden industry and the growing shipbuilding industry. By the 1950's, the menhaden industry had declined due to the modernization of fishing and processing techniques and the decrease in menhaden abundance.

During World War II, Greenport's shipyards became very active building naval vessels under government contract. The shipyards closed after the end of the war and, over the next 25 years, the Village economy went into severe decline. After the war, the mainstay of Greenport's economy was the fishing industry.

Recently, tourism and the number of second home owners have increased attracted by Greenport's commercial waterfront, shops, restaurants, and the architecturally distinctive homes. These factors have had an influence on Greenport's economy, resulting in the development and redevelopment of vacant, deteriorated, or underutilized properties along the waterfront in the Central Business District (CBD). With tourism and recreational boating demands increasing, dock space for commercial vehicles is in tight demand. This is compounded by the increasing demand for development of waterfront properties as tourist facilities or luxury condominiums. While today the local labor market does not depend as heavily as it once did on traditional maritime industries, the majority of the local labor market still relies on water-dependent occupations such as marinas, boat yards, commercial fishing, and boat building.

The Village's waterfront area is divided into three waterfront areas: Waterfront Area 1, Waterfront Area 2 and Waterfront Area 3. The CBD encompasses waterfront areas most of Greenport's retail commercial uses are found in this area. A coordinated program of building rehabilitation, infill development, and public improvement will improve the visual quality and economic vitality of the Village. Recently, the number of recreational boats and the demand for docking facilities for them have nearly eliminated the available dock space for commercial fishing vessels.

#### 4.2.2.2 Consistency with Village of Greenport Program (LWRP)

The Village of Greenport LWRP follows the 44 coastal policies in the NYS CMP.

The Village of Greenport has a draft HMP, dated December 17, 1998, that has not yet been finalized and/or approved. As discussed above, the Greenport Harbor is composed of the deep waters off the Village Center and a shallow inland waterbody called Stirling Basin. Greenport Harbor is reached through Gardiners Bay, which opens to the Atlantic Ocean and Long Island Sound to the east. In 1997, the NYSDOS identified the Village of Greenport as one of 17 maritime centers in the State in its report entitled *Long Island Sound Historic Centers of Maritime Activity*. The report proposed to reverse the decline of maritime centers and their working waterfronts. (HMP at 2-9).

To preserve the historic maritime character and encourage it to grow, the Greenport LWRP lists guidelines and standards to be used to determine consistency of proposed actions. One of the standards and guidelines to be followed is that the action "will not detract

from views of the water, particularly where the visual quality of the area is an important component of the area's appeal and identity." (Greenport LWRP at III-10).

Broadwater's analysis of its consistency with the Greenport LWRP is set forth below.

**POLICY 1:** *Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial and industrial, cultural, recreational and other compatible uses.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because the use of existing buildings to support its onshore business support facilities in Greenport will maintain existing, compatible uses that are an important part of Greenport's community character. Refer to Broadwater's response to LIS CMP Policy 1 above for further discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 1A:** *Revitalize Greenport's waterfront area by redeveloping deteriorated/underutilized properties and buildings for appropriate commercial and recreational uses.*

Refer to Broadwater's response to Greenport LWRP Policy 1 above for a discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 1B:** *Revitalize Greenport's central business district by restoring underutilized properties and buildings for appropriate retail commercial and other compatible uses.*

The Broadwater Project will be consistent with this LWRP policy because Broadwater will use existing buildings in Greenport to house its business support facilities. The placement of Broadwater's onshore facilities in Greenport in already existing buildings will avoid additional pressures on limited open space and visual access to the Greenport waterfront. Broadwater will ensure that its onshore facilities do not "affect existing views in an insensitive manner." (Greenport LWRP at III-5). For additional discussion regarding Broadwater's consistency with this LWRP policy, refer to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

**POLICY 2:** *Facilitate the siting of water-dependent facilities on or adjacent to coastal waters.*

The Broadwater Project is consistent with the objectives and goals of this LWRP policy, as waterfront onshore facilities in the Village of Greenport will be necessary for the operation of Broadwater's water-dependent business. For example, Broadwater's use of existing buildings on the Greenport waterfront adjacent to the water will support Broadwater's transfer of people, equipment, and cargo to the FSRU. In addition, Broadwater will use such waterfront locations to moor vessels used for these operations. Refer to Broadwater's response to LIS CMP Policy 10 above for further discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 3:** *The state coastal policy regarding major ports is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone. Refer to Broadwater's response to State Coastal Management Program Policy 3 below for further discussion.

**POLICY 4:** *Strengthen the economic base of small harbor areas by encouraging the development and enhancement of those traditional uses and activities which have provided such areas with their unique maritime identity.*

The Broadwater Project is consistent with the goals and objectives of this policy as the Broadwater Project will maintain the marine-based character of Greenport's LWRP working waterfront. In particular, Broadwater's onshore business support facilities will be consistent with certain traditional waterfront uses, such as docking of vessels used to support commerce within the Sound. Thus, while not as much of Greenport's waterfront is used today for the traditional industries of commercial fishing and shipbuilding as in the past, Broadwater's onshore operations in Greenport will be consistent with the traditional uses found along the waterfront, including ship repair, building and storage yards, fish marketing, processing and packaging, dockage facilities, marine contracting for docks, jetties and bulkheads, and marine supplies. The Greenport LWRP states: "It is the presence of these traditional maritime uses, their related sounds, the smell of the salt air and freshly caught fish, the noise and visual impact of harbor and sea bound vessels, and the architecturally rich resources of the village which comprise the traditional maritime character of Greenport." (Greenport LWRP at III-9). Broadwater's onshore operations in Greenport will be respectful of the LWRP's identification of Greenport as "an outstanding example of an historic small harbor with a maritime identity." (Greenport LWRP at III-9).

Refer to Broadwater's response to LIS CMP Policy 1 above for further discussion of the Broadwater Project's compliance with this LWRP policy. Refer also to Broadwater's discussion of economic benefits and effects that are anticipated with the Broadwater Project as set forth in Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 5:** *Encourage the location of development in areas where public services and facilities essential to such development are adequate, except when such development has special functional requirements or other characteristics which necessitates its location in other coastal areas.*

The Broadwater Project will be consistent with this LWRP policy because the proposed onshore facilities that will be located in Greenport are not anticipated to have unusual or special functional requirements. The existing public services in the Village of Greenport will

be adequate to support Broadwater's onshore facilities that are located there. Broadwater will coordinate with Greenport's emergency services and other public service departments as necessary to ensure adequate communication regarding Broadwater's business operations at its Greenport locations.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 5A:** *Maintain and where necessary improve public services and infrastructure which serve the village waterfront area and central business district to assure their continued availability to meet existing and limited future development needs.*

Refer to Broadwater's response to Greenport LWRP Policy 5 above for a discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 6:** *Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.*

The Broadwater Project does not anticipate that it will require any permits from the Village of Greenport for its onshore business support locations, which will use existing buildings in properly zoned and thus, suitable locations. Onshore facilities operators will comply with applicable permitting requirements. Refer to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O, for additional discussion of issues raised by this LWRP policy.

**POLICY 7:** *The state coastal policy regarding the protection of significant coastal fish and wildlife habitats is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 8:** *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sublethal or lethal effect on those resources.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because it will protect marine and living resources in the coastal area from the introduction of hazardous wastes and other pollutants that can bio-accumulate in the food chain or cause significant sublethal or lethal effect on those resources.

Refer to Broadwater's response to LIS CMP Policy 8 above for further discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Section 2.1.2.8.1 regarding the Broadwater Project's waste and waste handling for further discussion and analysis regarding Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 9:** *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources. Such efforts shall be made in a manner which ensures the protection of renewable fish and wildlife resources and considers other activities dependent on them.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy as a result of its Social Investment Program, which will review with stakeholders the options of establishing a social investment fund or foundation for the funding of regional projects that will benefit the environment and the public alike. Such funding could, among other things, result in increased access to existing fish and wildlife resources in Long Island's coastal areas, including Greenport, as well as the development of new or additional resources. A more detailed discussion of Broadwater's Social Investment Program is set forth in Appendix L.

**POLICY 10:** *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by: (i) encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities; (ii) increasing marketing of the state's seafood products; and (iii) maintaining adequate stocks and expanding aquaculture facilities. Such efforts shall be in a manner which ensures the protection of such renewable fish resources and considers other activities dependent on them.*

The Broadwater Project is consistent with this LWRP policy to the extent that the placement of the FSRU in a distant, offshore location preserves and protects existing marine resources, including finfish, shellfish and crustaceans, in the Long Island Sound area, including such resources in Greenport. The Broadwater Project does not propose to place or operate facilities in the Village of Greenport that conflict with the objectives of this policy.

See also Broadwater's Essential Fish Habitat Assessment, which is annexed as Appendix G, Broadwater's Fishermen Outreach Survey, which is annexed as Appendix H, and Broadwater's Social Investment Program, annexed as Appendix L, for additional discussion and analysis establishing Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 10A:** *Encourage the development of new, or expanded commercial fishing facilities in Greenport, and protect existing commercial fishing facilities from encroachment by potentially conflicting land uses.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because Broadwater's onshore business support facilities in Greenport will be located in existing buildings and these land uses will not encroach on existing commercial fishing facilities within the Village of Greenport.

**POLICY 11:** *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

The Broadwater Project will utilize existing facilities in Greenport for its onshore business support locations. The use of such facilities is likely to avoid damage to property due to flooding and erosion. Refer to Broadwater's response to LIS CMP Policy 4 above for additional discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O, regarding Broadwater's proposed onshore facilities in Greenport.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 12:** *Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs. Primary dunes will be protected from all encroachments that could impair their natural protective capacity.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because business related activities that will take place in the Greenport coastal area, will be located in existing buildings along the coast and will not affect natural resources or other property due to flooding and erosion. Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 13:** *The state coastal policy regarding the protection of erosion protective features is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 13A:** *The construction or reconstruction of docks, seawalls, revetments, bulkheads, breakwaters, and other shoreline structures shall be undertaken in a manner which will, to the maximum extent practicable, protect against or withstand the destructive forces of wave action and ice movement for a thirty year period.*

The Broadwater Project will comply with this requirement of docks, seawalls, revetments, bulkheads, breakwaters, or other shoreline structures that are required as part of its onshore business support facilities in Greenport. Currently, no such facilities are anticipated. Any such structure would be constructed only in accordance with applicable standards. For additional discussion regarding Broadwater's consistency with this LWRP policy, refer to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.



**POLICY 14:** *Activities and development including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.*

Refer to Broadwater's response to LIS CMP Policy 4, and Greenport LWRP Policies 12, 13 & 13A above for a discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 15:** *Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.*

The Broadwater Project is consistent with the goals and objectives with this LWRP policy as there will be no mining, excavation or dredging in coastal waters within Greenport's coastal boundary that could interfere with the natural coastal processes. Trenching activities for the purposes of Broadwater pipeline will not interfere with the natural coastal processes, including those that are the focus of this policy. Refer also to Broadwater's response to LIS CMP Policy 4 above for additional discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 16:** *Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.*

As the Broadwater Project will not receive public funds, this LWRP policy does not apply to the Broadwater Project.

**POLICY 17:** *Whenever possible, use non-structural measures to minimize damage to natural resources and property from flooding and erosion. Such measures shall include: (i) the set back of buildings and structures; (ii) the planting of vegetation and the installation of sand fencing and draining; (iii) the reshaping of bluffs; and (iv) the flood-proofing of buildings or their elevation above the base flood level.*

The Broadwater Project is consistent with the goals and objectives of this policy because Broadwater's use of existing buildings in the Village of Greenport makes use of in-place infrastructure that is unlikely to be subject to flooding and erosion due to the elevation of such buildings above the base flood level. It is unlikely that there will be a need to alter the physical location of the primary structures of Broadwater's onshore facilities. If Broadwater's onshore facilities may be exposed to flooding and erosion, Broadwater will, when possible, use non-structural measures to minimize damage to natural resources and property from flooding and erosion, including the use of vegetation and sand fencing and draining. Refer also to Broadwater's Onshore Facilities Resource Reports for additional discussion of issues raised by this policy, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 18:** *To safeguard the vital economic, social and environmental interest of the state and its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the State has established to protect valuable coastal resource areas.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because it has given full consideration to the economic, social, and environmental interests of the State and its citizens and to the safeguards that the State has established to protect valuable coastal resource areas. Refer to Broadwater's response to LIS CMP Policies 1, 2, 3, 5, 6, 7, 8, 9, 10, 11 above for a discussion of the Broadwater Project's compliance with this LWRP policy. See also Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, annexed as Appendix F, for further confirmation of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 19:** *Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities so that these resources and facilities may be fully utilized by all the public in accordance with reasonably anticipated public recreation needs and the protection of historic and natural resources. In providing such access, priority shall be given to public beaches, boating facilities, fishing areas and waterfront parks.*

The Broadwater Project will be consistent with this LWRP policy as it will be protective and respectful of the level and types of access to public water-related recreation as well as historic and natural resources. Broadwater's use of existing buildings for its onshore business support facilities will protect existing waterfront access for the public, as well as historic and natural resources. Refer to Broadwater's response to LIS CMP Policy 9 above for a discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F, and Broadwater's Marine/Land Use Compatibility Assessment, which is annexed as Appendix E, for further confirmation of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 20:** *Access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned shall be provided, and it should be provided in a manner compatible with adjoining uses. Such lands shall be retained in public ownership.*

The Broadwater Project will be consistent with the goals and objectives of this LWRP policy because it will not limit access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned. Broadwater's water-dependent business support operations that take place in the Village of Greenport would be consistent with existing waterfront uses in those locations. Refer to Broadwater's response to LIS CMP Policy 9 above for further discussion of the Broadwater Project's compliance with this LWRP policy. See also Broadwater's Marine/Land Use Compatibility Assessment, which is annexed as Appendix E.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 20A:** *Access to the publicly owned foreshore and to lands immediately adjacent to the foreshore or the water's edge shall be provided through the creation of a harborwalk in Waterfront Area 2.*

The Broadwater Project will be consistent with the goals and objectives of this LWRP policy because Broadwater's permanent onshore facilities in the Village of Greenport, which will include leased land required for office space, warehousing, and a waterfront facility, will not impact access to the publicly owned foreshore and to lands immediately adjacent to the foreshore or the water's edge. To the extent that Broadwater's onshore business support operations will be located on leased property in Waterfront Area 2, Broadwater will ensure that its operations are consistent and will not interfere with the objectives of this LWRP policy. Refer also to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O, for additional discussion of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 21:** *Water-dependent and water-enhanced recreation will be encouraged and facilitated, and will be given priority over non-water related uses along the coast, provided it is consistent with the preservation and enhancement of other coastal resources and takes into account demand for such facilities. In facilitating such activities, priority shall be given to areas where access to the recreation opportunities of the coast can be provided by new or existing public transportation services and to those areas where the use of the shore is severely restricted by existing development.*

The Broadwater Project is consistent with this LWRP policy because Broadwater's onshore business support operations in waterfront locations will be water-dependent, including the mooring of tugs and FSRU support vessels, and access for vessels transporting people and cargo between shore and the FSRU. The proposed site for the Broadwater Project onshore facilities in Greenport is located in Waterfront Areas 1 and 2. The

selection of this location is consistent with the goals of the Greenport LWRP, to protect and maintain water-dependent uses and enhance the Village as a commercial and business center, among others. Refer to Broadwater's response to LIS CMP Policy 10 above for a discussion of the Broadwater Project's compliance with this LWRP policy. Refer also to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 21A:** *Redevelop the Mobil site for public waterfront recreational use.*

The Mobil site that is the subject of this LWRP policy is located in Waterfront Area 3. As the specific parcels proposed for Broadwater's onshore facilities in Greenport fall within areas designated as Waterfront Area 1 and Waterfront Area 2, this LWRP policy does not apply to the Broadwater Project.

**POLICY 22:** *Development, when located adjacent to the shore, will provide for water-related recreation, as a multiple use, whenever such recreational use is appropriate in light of reasonably anticipated demand for such activities and the primary purpose of the development.*

The Broadwater Project, which will lease property for its proposed onshore business support facilities on Greenport's waterfront, will serve the primary purpose of providing marine transfer of people, equipment, and FSRU support vessels. Because the primary purpose of these onshore facilities will be part of the existing, working waterfront, it is unlikely that Broadwater's operations on these leased properties will provide for water-related recreation at such locations. Such water-related recreation may be provided elsewhere in the Long Island Sound coastal area, including, among other places, Greenport, as part of Broadwater's Social Investment Program. Refer to Broadwater's response to LIS CMP Policy 10 above for a discussion of the Broadwater Project's compliance with this LWRP policy. Refer also to Broadwater's Onshore Facilities Resource Reports, which is annexed as Appendix O, and to Broadwater's Social Investment Program, which is annexed as Appendix L.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 23:** *Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the state, its communities, or the nation.*

The Broadwater Project is consistent with this LWRP policy because its proposed location for onshore business support facilities in Greenport does not contain resources listed or eligible for listing in the NRHP or known archaeological sites. Two sites listed on the NRHP – the Greenport Railroad Station and the Greenport Village Historic District – are directly adjacent to the proposed location from the north and west, respectively. For additional discussion regarding the existing site conditions pertaining to historic, archaeological, and cultural resources, refer to Existing Site Conditions, Chapter 3.4.2, above. Refer also to Broadwater's Onshore Facilities Resource Reports at Section 4-1 to 4-2, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 24:** *The state coastal policy regarding scenic resources of statewide significance is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 25:** *Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance but which contribute to the overall scenic quality of the coastal area.*

The Broadwater Project is consistent with this LWRP policy because Broadwater's proposed location for the FSRU as well as its onshore locations in the Village of

Greenport are respectful of natural and man-made resources in the Long Island Sound coastal area, including Greenport, that are not identified as being of statewide significance but that contribute to the overall scenic quality of the area.

Broadwater's proposal for onshore facilities in Waterfront Areas 1 and 2 is consistent with the existing visual features in the surrounding area, which vary widely from rugged, bulkheaded shorelines, with areas of natural beach and maritime vegetation, to historic waterfront commercial and residential settlements. These elements, combined with varied and "spectacular views," all contribute to making Greenport's shoreline a "unique and valuable waterfront resource of high visual quality." (Greenport LWRP at III-29-30). Preserving and protecting the small harbor character and architecturally rich resources of the Village will further the goal of improving the scenic quality in the Village. (Greenport LWRP at III-30). Broadwater's business support operations will continue and be consistent with Greenport's character as a working waterfront.

For additional discussion regarding the Broadwater Project's consistency with this LWRP policy, refer to Broadwater's responses to LIS CMP Policies 1, 3, 9, above. *See also* Existing Conditions Section 3.6.4, above. Refer also to Broadwater's Land/Marine Use Conflict Assessment and Long Island Sound Use Patterns and Trends Analysis, which are annexed as Appendix E and Appendix N, and Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 26:** *The state coastal policy regarding the protection of agricultural lands is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 27:** *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment, and the facility's need for a shorefront location.*

The Broadwater Project is consistent with this LWRP policy because the LNG terminal and interconnection pipeline will not be sited or constructed in the Village of Greenport. In fact, Broadwater proposes only to locate business support facilities at existing, onshore locations in the Village of Greenport. The leased facilities that Broadwater proposes would support operations that are consistent with the Village's heritage and character, which is closely connected to the Sound. (Greenport LWRP at III-31). For additional discussion regarding the Broadwater Project's consistency with this LWRP policy, refer to Broadwater's responses to LIS CMP Policies 1, 10 and 13, above. Refer also to Broadwater's Land/Marine Use Conflict Assessment, annexed as Appendix E, the Long Island Sound Use Patterns and Trends Analysis, annexed as Appendix N, and Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.



For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 28:** *The state coastal policy regarding ice management is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 29:** *Encourage the development of energy resources on the outer continental shelf, in Lake Erie and other water bodies, and ensure the environmental safety of such activities.*

The Broadwater Project is consistent with this LWRP policy because it will introduce a new supply of natural gas into the target markets, using the abundant and vast waters of Long Island Sound. Broadwater's selected location for its LNG terminal and interconnection pipeline in the central portion of Long Island Sound avoids safety issues that would otherwise be relevant to an onshore LNG facility. Here, the Village of Greenport will be a minimum of 15 miles away from the FSRU from any given location within the Village. Additional discussion regarding the Broadwater Project's consistency with this LWRP policy is set forth in Broadwater's responses to LIS CMP Policies 1, 5, 8, and 13, above. Refer also to Broadwater's reports on Water and Sediment Quality and Air Quality, which are annexed as Appendix A and Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 30:** *Municipal, industrial, and commercial discharge of pollutants including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.*

Consistent with this LWRP policy, Broadwater will comply with state and national water quality standards that are applicable to the Broadwater Project. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 5. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 31:** *State coastal area policies and purposes of approved local waterfront revitalization programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already overburdened with contaminants will be recognized as being a development constraint.*

The Broadwater Project will operate consistent with applicable water quality standards. In addition, because Broadwater will be using existing facilities for its proposed onshore locations in Greenport, no water quality impacts from construction or operation of the proposed onshore facilities are anticipated. Additional analysis and discussion confirming the Broadwater Project's consistency with this LWRP policy is set forth in Broadwater's response to LIS CMP Policy 5. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 32:** *The state coastal policy regarding the use of alternative sanitary waste systems is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 33:** *Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.*

Broadwater will use BMPs to control stormwater runoff and combined sewer overflows draining into coastal waters for any onshore facilities located in the Village of Greenport consistent with this LWRP policy. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 5. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 34:** *Discharge of waste materials into coastal waters from vessels will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.*

The Broadwater Project is consistent with this LWRP policy because Broadwater will operate in a manner that is protective of significant fish and wildlife habitats and recreational areas. The Broadwater Project is not anticipated to impact water supply areas within the Long Island Sound coastal region, including the Village of Greenport. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 5. Refer also to Broadwater's report on Water and

Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 35:** *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

This LWRP policy arguably applies only to the waters within the coastal boundary of the Village of Greenport. Because the FSRU will be placed outside of the Greenport coastal boundary in a distant, offshore location, the Broadwater Project eliminates the need for dredging that would likely be necessary to accommodate the draft of LNG carriers servicing an onshore LNG terminal. No dredging at the existing facilities in the Village of Greenport to accommodate tugs or other vessels is anticipated as a result of the Project. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in the Project Description set forth in Chapter 2, Section 2.2 *et seq.*, above. *See also* Broadwater's Onshore Facilities Resource Reports, Section 1.2 at 1-6, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 36:** *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

This LWRP policy ostensibly applies only to activities within the Greenport coastal boundary. The Broadwater Project is consistent with this LWRP policy as Broadwater will employ multiple measures to ensure the proper storage and shipment of petroleum and other hazardous materials to prevent or minimize the potential for spills into coastal waters. For proposed onshore facilities located in the Village of Greenport, there will be no bulk storage of fuel required. Material handling at the waterfront facilities will involve the transfer of certain containerized liquids, such as aqueous ammonia and mercaptan. The liquid transfers would be facilitated by the use of isotanks to ensure the safe transfer of such materials and minimize the potential for a spill or discharge. The onshore facilities will also provide an emergency response center for the Broadwater Project to ensure that the cleanup of any accidental discharges is expedited.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 8. *See also* Broadwater's Onshore Facilities Resource Reports, Section 1 at 1-1 to 1-7 and Section 2.2, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 37:** *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.*

This LWRP policy ostensibly applies only to discharges within the Greenport coastal boundary. Broadwater will employ multiple measures to minimize non-point discharge of excess nutrients, organics, and eroded soils into coastal waters consistent with this LWRP policy. The proposed locations for onshore facilities in the Village of Greenport are already developed, paved locations. The Broadwater Project will not result in significant movement of land or excavation of these already developed locations. As such, the Broadwater Project will not result in uncontrolled or excessive non-point discharge of nutrients, organics and eroded soils into the coastal waters surrounding the Village of Greenport.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 8. *See also* Broadwater's Onshore Facilities Resource Reports, Section 1 at 1-1 to 1-7 and Section 2.2, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 38:** *The quality and quantity of surface water and groundwater supplies will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.*

The Broadwater Project is consistent with this LWRP policy because the onshore, business support facilities and related operations that are proposed for the Village of Greenport are not anticipated to result in impacts to the surface water or groundwater supplies. Additional analysis and discussion confirming the Broadwater Project's consistency with this LWRP policy is set forth in Broadwater's response to LIS CMP Policy 5. *See also* Broadwater's Onshore Facilities Resource Reports, Section 2.2 at 2-1 to 2-3, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 39:** *The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural lands and scenic resources.*

The Broadwater Project will be consistent with this LWRP policy because any transportation, storage, treatment, and disposal of solid wastes, particularly hazardous wastes, within the Greenport coastal area will be protective of groundwater and surface water supplies, fish and wildlife habitats, recreation areas, agricultural lands, and scenic resources. A discussion of the fish, vegetation, and wildlife habitat that exists at the proposed Greenport location for

Broadwater's onshore facilities is set forth in Broadwater's Onshore Facilities Resource Reports, Section 2.2 and Section 3.1 at 3-1 to 3-8, annexed as Appendix O. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 8.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 40:** *The state coastal policy regarding effluent discharged from electric generating and industrial facilities is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 41:** *Land use or development in the coastal area will not cause national or state air quality standards to be violated.*

The Broadwater Project is consistent with this LWRP policy because it will not cause national or state air quality standards to be violated. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's report addressing Air Quality, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 42:** *Coastal management policies will be considered if the State reclassifies land areas pursuant to the Prevention of Significant Deterioration regulations of the Federal Clean Air Act.*

This LWRP policy is not applicable to the Broadwater Project.

**POLICY 43:** *Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.*

The Broadwater Project is consistent with this LWRP policy because it will meet applicable national or state air quality standards. Moreover, the introduction of a new supply of natural gas to the target markets is expected to improve air quality. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's report addressing Air Quality, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 44:** *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

The Broadwater Project is consistent with this LWRP policy because there are no freshwater wetlands or NWI wetlands within or adjacent to the proposed location for onshore facilities in the Village of Greenport. Refer also to Broadwater's Onshore Facilities Resource Reports, which is annexed as Appendix O, for additional discussion of issues raised by this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

#### **4.2.3 Town of Smithtown LWRP**

The Town of Smithtown has an approved LWRP that received OCRM concurrence on September 7, 1989. In June 2004, the Town submitted an amendment to the NYS DOS to update the 1989 LWRP to reflect local environmental and development conditions and to conform the LWRP with the LIS CMP.<sup>14</sup>

The Town of Smithtown is located in the northwest part of Suffolk County and is bounded on the north by Long Island Sound, and on the west, south and east by the towns of Huntington, Islip and Brookhaven, respectively. The Waterfront Revitalization Area boundary includes the shoreline of Long Island Sound, along with the Nissequogue River and Stony Brook Harbor, which are estuaries leading into the Sound.

The LWRP identifies the following elements that give vistas importance: visibility of the water; the lack of features that do not fit into the overall scene; the presence of conspicuous foreground, midground, and background features the composition of elements in the view, and the visibility of the scene. (Smithtown LWRP at II-26).

The Town of Smithtown's LWRP follows the 44 coastal policies in the NYS CMP and contains statements of additional policies that are relevant to local conditions.

#### **June 2004 Amendment to the Town of Smithtown LWRP**

In June 2004, the Town of Smithtown submitted an amendment to the NYS DOS to update the 1989 LWRP to reflect local environmental and development conditions, in particular with respect to the former Kings Park Psychiatric Center (KPPC) and to conform the LWRP with the LIS CMP. The LWRP amendment will increase the waterfront area by approximately 80 acres to include the NYSDEC's Nissequogue River Scenic and Recreational Corridor and to include a 50-acre vacant parcel and small commercial parcel adjacent to the former KPPC site.

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<sup>14</sup> The 1989 LWRP follows the State's 44 coastal policies.



#### 4.2.3.1 History of the Town of Smithtown

The waterfront in the Town of Smithtown is characterized by a diversity of high quality visual character types. A large portion of the waterfront is publicly owned. The largest public facilities in the waterfront area include Sunken Meadow State Park, Caleb Smith State Park, and the former KPPC. The shoreline is generally smooth, except for the Sunken Meadow Creek, the Nissequogue River, and Stony Brook Harbor. There are steep escarpments (50-125 feet in height) situated behind coarse sand beaches.

The Town's local economy is not based on its waterfront; the industrial areas are located near important transportation facilities and outside of the waterfront area. Due to environmental constraints, the Town of Smithtown guides development away from the waterfront area.

Waterborne transportation was important to the early economy of Smithtown's waterfront when ships were the dominant mode of transportation. However, due to the lack of a good harbor, Smithtown was less regionally important than Huntington, Northport, and Port Jefferson, which are all located adjacent to deep, well protected harbors.

As modes of transportation and industrial technology evolved, the waterfront lost its commercial and geographic significance. In the 1870's, the Long Island Railroad was extended through Smithtown and a new commercial center developed around the railroad station.

In recent years, there has been a high demand for housing in Long Island which has caused increased pressure for higher density development in Smithtown generally. (June 2004 Draft Amendment to LWRP, at II-30). This has resulted in development pressure in the waterfront area due to the lack of suitable development land outside of the waterfront area. (*Id.*).

The visual quality of the waterfront landscape, consisting of rolling terrain, bluffs, beaches, ponds, streams, the Nissequogue River, Stony Brook Harbor, Sunken Meadow Creek, and Smithtown Bay, is considered a significant resource of the Town. The features are mostly in their natural condition. Most of the vegetation of the waterfront contains tidal wetlands, freshwater marshes, oak forests, abandoned fields, and transitional vegetation. "The fact that Smithtown's waterfront is so heavily wooded is also beneficial to the visual quality because the vegetation obscures many structures that contrast with the natural landscape." (Smithtown LWRP at II-25).

The structural components of the waterfront landscape consist of man-made objects such as buildings, roads, and power lines. Few of these structures have been built along the beaches and few are visible from the water. There are some houses east of Sunken Meadow Park that are outside of the waterfront area and are only visible from the water. However, they "do not seem to be significant, as they are small and scattered elements that are set back one half mile from the shore." (Smithtown LWRP at II-25).

There are a number of significant vistas in the waterfront including the summit on NYS 25A at Sunken Meadow Park, which is considered to be "one of the most important vistas of Long Island Sound from Long Island. The view has a good composition and has a high value foreground, midground, and background features." (Smithtown LWRP at II-25).

#### 4.2.3.2 Policies of the Town of Smithtown LWRP

**POLICY 1:** *Restore, revitalize, and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.*

The Broadwater Project will not utilize any waterfront locations in the Town of Smithtown coastal boundary. As such, this LWRP policy is not applicable to the Broadwater Project. Even assuming however, that this LWRP were applicable, the Broadwater Project is consistent with this LWRP policy. Broadwater completed an analysis of visually sensitive receptors, including the Nissequogue or Sunken Meadow State Parks in Smithtown, which confirms that the FSRU will not be visible from either location. Refer to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O, for additional discussion of Broadwater's onshore facilities.

**POLICY 1A** *Rehabilitate deteriorating residential structures in San Remo and in the vicinity of the Kings Park Bluff.*

The Broadwater Project will not involve any onshore structures, residential or otherwise, in the Town of Smithtown coastal boundary. As such, this LWRP policy is not applicable to the Broadwater Project.

**POLICY 1B** *Redevelop the west end of the Smithtown CBD to a hub of water dependent and water enhanced, low key residential uses with a mix of water enhanced residential and commercial uses.*

The Broadwater Project does not propose any onshore development in the Town of Smithtown coastal boundary. As such, this LWRP policy is not applicable to the Broadwater Project.

**POLICY 1C** *When the Kings Park Psychiatric Center is no longer needed for its original purpose, restore and revitalize the core area of the center for institutional and residential uses and redevelop the periphery of the center for a mix of recreational, conservation and agricultural use.*

The Broadwater Project does not propose any onshore development in the Town of Smithtown coastal boundary, including any development involving the KPPC. As such, this LWRP policy is not applicable to the Broadwater Project.

**POLICY 2:** *Facilitate the siting of water dependent uses and facilities on or adjacent to coastal waters.*

The Broadwater Project is a water dependent use. Broadwater is in the business of serving the target markets with overseas-sourced energy, which requires the transport of LNG to the FSRU for vaporization into natural gas and the delivery of the resulting natural gas to the subsea IGTS pipeline and into the target markets. Refer to Broadwater's response to LIS CMP Policy 10 above for further discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 3:** *The state coastal policy regarding development of major ports is not applicable to the Town of Smithtown.*

As explicitly stated, this LWRP policy does not apply to the Smithtown coastal zone. Refer to State CMP Policy 3 below for further discussion.

**POLICY 4:** *The state coastal policy regarding the strengthening of small harbor areas is not applicable to Smithtown.*

As explicitly stated, this LWRP policy does not apply to the Smithtown coastal zone. Refer to State CMP Policy 4, below for further discussion.

**POLICY 5:** *Encourage the location of development in areas where public services and facilities essential to such development are adequate, except when such development has special functional requirements or other characteristics which necessitates its location in other coastal areas.*

The Broadwater Project does not propose to locate any onshore facilities in Smithtown. Therefore, the Broadwater Project will not require the use of Smithtown's public services and facilities. Because of the distant, offshore location that is proposed for the FSRU and connecting pipeline, this policy does not apply to these offshore facilities. The Broadwater Project, therefore, will be consistent with this LWRP policy.

**POLICY 5A:** *Prevent development of vacant undersized lots in San Remo which, if developed, would pose health and/or safety hazards by reason of location in flood hazard zones, poor drainage, shallow depth to groundwater, poor soil conditions, or inadequate size.*

The Broadwater Project will not involve development of any vacant land in Smithtown. Therefore, this LWRP policy is inapplicable to the Broadwater Project.

**POLICY 5B** *A bridge connecting Long Island and Connecticut shall not be located in the Smithtown waterfront area.*

The Broadwater Project does not propose to build a bridge connecting Long Island and Connecticut in the Smithtown waterfront area. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 6:** *Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.*

The Broadwater Project does not propose any onshore locations in Smithtown. Therefore, no permits related to development in Smithtown are required for the Broadwater Project.

**POLICY 7:** *Significant coastal fish and wildlife habitats, as identified on the coastal area map, shall be protected, preserved, and, where practical, restored so as to maintain their viability as habitats.*

The Broadwater Project is consistent with the goals and objectives of this policy because it will protect and preserve coastal fish habitats and living marine resources in the Long Island Sound coastal area. And because no onshore facilities are proposed in Smithtown, the Broadwater Project will preserve existing fish and wildlife habitats in the Smithtown coastal area. Refer to Broadwater's response to LIS CMP Policy 6 above for further discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 7A:** *The Nissequogue River Habitat shall be protected, preserved and restored so as to maintain its viability as a habitat.*

The Nissequogue River Habitat will be preserved with the Broadwater Project because Broadwater does not propose any onshore facilities in Smithtown. Broadwater's distant offshore location for the FSRU and connecting pipeline will also preserve this habitat. Therefore, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 7B:** *The Nissequogue Inlet Beaches Habitat shall be protected, preserved, and managed so as to maintain its viability as habitat for protected nesting shorebirds and terrapin.*

The Nissequogue Inlet Beaches Habitat will be preserved with the Broadwater Project because Broadwater does not propose any onshore facilities in Smithtown. Broadwater's distant offshore location for the FSRU and connecting pipeline will also preserve this habitat. Therefore, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 7C:** *The Stony Brook Harbor Habitat shall be protected, preserved, managed and restored so as to maintain its viability as habitat for shellfish, protected nesting shorebirds, and wintering waterfowl.*

The Stony Brook Harbor Habitat will be preserved with the Broadwater Project because Broadwater does not propose any onshore facilities in Smithtown. Broadwater's distant offshore location for the FSRU and interconnection pipeline will also preserve this habitat. Therefore, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 7D:** *Other locally significant habitats (Fresh Pond, Sunken Meadow Creek, and Head of the River) shall be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

Locally significant habitats will be preserved with the Broadwater Project because Broadwater does not propose any onshore facilities in Smithtown. Broadwater's distant offshore location for the FSRU and interconnection pipeline will also preserve this habitat. Therefore, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 8:** *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bioaccumulate in the food chain or which cause significant sublethal or lethal effect on those resources.*

The Broadwater Project is consistent with this LWRP policy because the fish and wildlife resources in the Smithtown coastal boundary will be protected from hazardous wastes and other pollutants that can bio-accumulate in the food chain or cause significant sublethal or lethal effect on those resources. Broadwater's distant offshore location for the FSRU and interconnection pipeline will preserve this habitat.

Refer to Broadwater's responses to LIS CMP Policies 6 and 8, as well as Greenport LWRP Policy 8 for further discussion of the Broadwater Project's compliance with this policy. See also Section 2.1.2.8.1 regarding the Broadwater Project's waste and waste handling for further discussion and analysis regarding Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 9:** *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks and developing new resources. Such efforts shall be made in a manner which ensures the protection of renewable fish and wildlife resources and considers other activities dependent on them.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy as a result of its Social Investment Program, under which Broadwater will consider establishing a social investment fund or foundation for the funding of regional projects that will benefit the environment and the public alike. Such funding could, among other things, result in increased access to existing fish and wildlife resources in Long Island's coastal areas as well as the development of new or additional resources. A more detailed discussion of Broadwater's Social Investment Program is set forth in Appendix L.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 9A:** *Maintain the supply of shellfish and finfish for recreational fisherman as well as for commercial fishermen through mariculture and shellfish management programs.*

Refer to Broadwater's response to Policy 9 above for a discussion of Broadwater's consistency with this LWRP policy.

**POLICY 10:** *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by: i. encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities; ii. increasing marketing of the State's seafood products; and iii. maintaining adequate stocks and expanding aquaculture facilities. Such efforts shall be in a manner which ensures the protection of such renewable fish resources and considers other activities dependent on them.*

The placement of the FSRU in a distant, offshore location preserves and protects existing marine resources, including finfish, shellfish and crustaceans, in the Town of Smithtown and the Long Island Sound area. Refer to Broadwater's response to LIS CMP Policy 6 above for a discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Broadwater's Essential Fish Habitat Assessment, which is annexed as Appendix G, and Broadwater's Fishermen Outreach Survey, which is annexed as Appendix H, for additional discussion and analysis establishing Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 11:** *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

The Broadwater Project does not propose to locate buildings or structures in the Smithtown coastal area. Therefore, this LWRP policy is inapplicable to the Broadwater Project.

**POLICY 12:** *Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs. Primary dunes will be protected from all encroachments that could impair their natural protective capacity.*

The Broadwater Project does not propose to conduct activities or development in the Smithtown coastal area. Therefore, this LWRP policy is inapplicable to the Broadwater Project.



**POLICY 13:** *The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.*

The Broadwater Project does not propose to conduct activities or development in the Smithtown coastal area, including the construction or reconstruction of erosion protection structures. Refer to Broadwater's response to LIS CMP Policy 4 above for additional discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 14:** *Activities and development, including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.*

The Broadwater Project does not propose to conduct activities or development in the Smithtown coastal area, including the construction or reconstruction of erosion protection structures. Refer to Broadwater's response to LIS CMP Policy 4, and Greenport LWRP Policies 12, 13 & 13A above for a discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 14A:** *Undertake erosion control and management techniques for all phases of new development, including construction.*

The Broadwater Project does not propose to conduct activities or development in the Smithtown coastal area, including the construction or reconstruction of erosion protection structures. Refer to Broadwater's response to LIS CMP Policy 4 above for additional discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 15:** *Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.*

The Broadwater Project is consistent with the goals and objectives with this LWRP policy as there will not be mining, excavation or dredging in coastal waters within Smithtown's coastal boundary that could interfere with the natural coastal processes, including those that supply beach materials to land adjacent to such waters. Offshore trenching activities for the purposes of placing the Broadwater interconnecting pipeline will not interfere with the natural coastal processes, including those that are the focus of this policy. Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 16:** *Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.*

The Broadwater Project is privately funded and therefore this LWRP policy is not applicable.

**POLICY 17:** *Whenever possible, use non-structural measures to minimize damage to natural resources and property from flooding and erosion. Such measures shall include: i. the set back of buildings and structures; ii. the planting of vegetation and the installation of sand fencing and draining; iii. the reshaping of bluffs; and iv. the flood-proofing of buildings or their elevation above the base flood level.*

The Broadwater Project does not propose to locate any onshore facility in Smithtown. Therefore, the Broadwater Project will not require construction or other activities that could result in damage to natural resources and property from flooding and erosion in Smithtown.

**POLICY 17A:** *Natural vegetation shall be maintained to the greatest extent practicable, particularly at the bluffs at Old Dock Road Park.*

The Broadwater Project does not propose to locate any onshore facilities in Smithtown. Therefore, the Broadwater Project will maintain all existing natural vegetation, particularly at the bluffs at Old Dock Road Park. Therefore, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 18:** *To safeguard the vital economic, social and environmental interest of the State and of its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the State has established to protect valuable coastal resource areas.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because it has given full consideration to the economic, social, and environmental interests of the State and its citizens and to the safeguards that the State has established to protect valuable coastal resource areas. For example, and without limitation, with respect to such resources in Smithtown, Broadwater has considered certain resources – such as Nissequogue State Park and Sunken Meadow State Park – as part of its coastal zone consistency evaluation, and confirmed that the FSRU will not be visible from these locations. See Table 19, above.

Refer to Broadwater's response to LIS CMP Policy 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, above, for a discussion of the Broadwater Project's compliance with this LWRP policy. See also

Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F, for further confirmation of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 19:** *Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities so that these resources and facilities may be utilized by all the public in accordance with reasonably anticipated public recreation needs and the protection of historic and natural resources. In providing such access, priority shall be given to public beaches, boating facilities, fishing areas and waterfront parks.*

The Broadwater Project will be consistent with this LWRP policy because Broadwater's placement of its onshore facilities in other communities and offshore locations in the central portion of Long Island Sound will be protective and respectful of the level and types of access to public water-related recreation as well as historic and natural resources in the Smithtown coastal area. Refer to Broadwater's response to LIS CMP Policy 9 above for a discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F, and Broadwater's Marine/Land Use Compatibility Assessment, which is annexed as Appendix E, for further confirmation of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 20:** *Access to the publicly owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned shall be provided, and it shall be provided in a manner compatible with adjoining uses. Such lands shall be retained in public ownership.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because it will not limit access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned and located in the Smithtown coastal area. Broadwater's water-dependent business support operations will take place in other communities. Refer to Broadwater's response to LIS CMP Policy 9 above for further discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Broadwater's Marine/Land Use Compatibility Assessment, annexed as Appendix E.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 21:** *Water-dependent and water-enhanced recreation shall be encouraged and facilitated and shall be given priority over non-water related uses along the coast, provided it is consistent with the preservation and enhancement of other coastal resources and takes into account demand for such facilities. In facilitating such activities, priority shall be given to areas where access to the recreation opportunities of the coast can be provided by new or existing public transportation services and to those areas where the use of the shore is severely restricted by existing development.*

The Broadwater Project does not propose onshore locations in Smithtown and thus there will be no competition for waterfront property along the coast. Refer to Broadwater's response to LIS CMP Policies 9 and 10 above for a discussion of the issues raised by this LWRP policy.

**POLICY 21A:** *The size and speed of boats shall be restricted in the environmentally sensitive sections of Stony Brook Harbor, the Nissequogue River, and Sunken Meadow Creek.*

The Broadwater Project does not propose to use speed boats anywhere in the Smithtown coastal area. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 22:** *Development, when located adjacent to the shore, shall provide for water-related recreation, as a multiple use, whenever such recreational use is appropriate in light of reasonably anticipated demand for such activities and the primary purpose of the development.*

The Broadwater Project does not propose any development within the Smithtown coastal area. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 23:** *Protect, enhance and restore structures, districts, areas or sites that are of significance on the history, architecture, archaeology or culture of the State, its communities, or the nation.*

The Broadwater Project is consistent with this policy because it does not propose any onshore facilities in Smithtown. In addition, by siting the FSRU in a distant, offshore location, the Broadwater Project is respectful and protective of existing structures, districts, areas, or sites that are of significance to the history, architecture, archaeology and culture of the State, its communities, and the nation. For additional discussion regarding existing site conditions pertaining to historic, archaeological, and cultural resources, refer to Existing Site Conditions, Chapter 3.4.2, above. Refer also to LIS CMP Policy 2 above and to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 23A:** *Protect, restore, and rehabilitate locally significant historic sites in Sunken Meadow State Park, Caleb Smith State Park, and the Kings Park Psychiatric Center.*

The Broadwater Project is consistent with this LWRP policy because it does not propose any onshore facilities in Smithtown. In addition, by siting the FSRU in a distant, offshore location, the Broadwater Project is respectful and protective of locally significant historic sites, such as those in Sunken Meadow State Park, Caleb Smith State Park, and the Kings Park Psychiatric Center. For example, Broadwater is protective of Sunken Meadow State Park because the FSRU will not be visible from the park, as established Broadwater's VRA. For additional discussion regarding locally significant historic sites, refer to Existing Site Conditions, Chapter 3.4.2, above. Refer also to LIS CMP Policy 2, and Broadwater's VRA, which is attached as Appendix K.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 24:** *The state coastal policy regarding scenic resources of statewide significance is not applicable to the Town of Smithtown.*

As explicitly stated, this LWRP policy does not apply to the Smithtown coastal zone. Refer to State CMP Policy 24 for further discussion.

**POLICY 25:** *Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.*

The Broadwater Project is consistent with this LWRP policy because Broadwater's proposed FSRU and onshore locations are respectful of the natural and man-made resources in the Long Island Sound coastal area, including Smithtown, that are not identified as being of statewide significance but that contribute to the overall scenic quality of the area. For additional discussion regarding the Broadwater Project's consistency with this policy, refer to Broadwater's responses to LIS CMP Policies 1, 3, 9, above. See also Existing Conditions Section 3.6.4, above. Refer also to Broadwater's Land/Marine Use Conflict Assessment and Long Island Sound Use Patterns and Trends Analysis, which are annexed as Appendix E and Appendix N, and Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 25A:** *Protect, restore, and enhance the natural visual character of the Nissequogue River and adjacent areas as the river system is a locally significant scenic and recreational resource.*

The Broadwater Project is consistent with this LWRP policy because it protects the natural visual character of the Nissequogue River and adjacent areas. The Broadwater Project does not propose onshore facilities in Smithtown. The offshore location of the FSRU – which is more than 24 miles from Nissequogue State Park – will not be visible from the park.

Refer to Broadwater's responses to LIS CMP Policies 1 and 3 for additional discussion regarding issues raised by this policy. For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 25B:** *Prevent the irreversible modification of natural geological forms and the removal of vegetation from dunes, bluffs and wetland areas which are significant to the scenic areas of the Town of Smithtown.*

The Broadwater Project does not propose onshore facilities or other activities in the Smithtown coastal area. As such, the Broadwater Project will not result in irreversible modification of natural geological forms or the removal of natural vegetation that are significant to the scenic areas of Smithtown. Refer also to Broadwater's responses to Smithtown LWRP Policies 25 and 25A, above.

For all these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 25C:** *Protect the visual quality and enhance access to scenic overlooks in Sunken Meadow State Park and the Kings Park Psychiatric Center.*

The Broadwater Project is consistent with this policy because it is protective of the visual quality in the Smithtown coastal area. For example, Broadwater is protective of Sunken Meadow State Park because the FSRU will not be visible from the KPPC, as established Broadwater's VRA. (See Table 8, VP# LI49). Refer also to Broadwater's response to LIS CMP Policy 3 for additional discussion regarding Broadwater's consistency with the objectives of this policy.

For all these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 25D:** *Enhance the visual quality of the Smithtown CBD to make the area more compatible with the Nissequogue River.*

The Broadwater Project does not propose any onshore facilities in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 26:** *To conserve and protect the agricultural lands in the State's coastal area, an action shall not result in the loss, nor impair the productivity of important agricultural lands, as identified on the coastal area map, if that loss would adversely effect the viability of agriculture in an agricultural district or if there is no agricultural district, in the area surrounding such lands.*

The Broadwater Project does not propose any onshore facilities in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 26A:** *Encourage the retention of the remaining land actively used for agriculture in the Hamlet of Smithtown and prime agricultural soils in the Kings Park Psychiatric Center.*

The Broadwater Project does not propose any onshore facilities in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 27:** *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment, and the facility's need for a shorefront location.*

The Broadwater Project is consistent with this LWRP policy because the LNG terminal and interconnection pipeline will not be sited or constructed on the shorefront of Smithtown. Additionally, the location of Broadwater's FSRU and interconnection pipeline are appropriate uses of the Long Island Sound coastal area. For additional discussion regarding the Broadwater Project's consistency with this LWRP policy, refer to Broadwater's responses to LIS CMP Policies 1, 10, and 13, above. Refer also to Broadwater's Land/Marine Use Conflict Assessment and Long Island Sound's Use Patterns and Trends Analysis, which are annexed as Appendix E, and Appendix N, and Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 28:** *The state coastal policy regarding ice management is not applicable to the Town of Smithtown.*

As explicitly stated, this LWRP policy does not apply to the Smithtown coastal area. Refer to State CMP Policy 28 for further discussion.

**POLICY 29:** *Encourage the development of energy resources on the outer continental shelf, in Lake Erie and in other water bodies, and ensure the environmental safety of such activities.*

The Broadwater Project is consistent with this LWRP policy because it will introduce a new supply of natural gas into the target markets, using the abundant and vast waters of Long Island Sound. Broadwater's selected location for its LNG terminal and interconnection pipeline in the central portion of Long Island Sound avoids safety issues that would otherwise be relevant to an onshore LNG facility. Here, the nearest coastal community will be a minimum of 9 miles from the FSRU. The Broadwater Project is also protective of and is taking multiple measures to protect the natural resources of Long Island Sound. Additional discussion regarding the Broadwater Project's consistency with this policy is set forth in Broadwater's responses to LIS CMP Policies 1, 5, 8, and 13, above. Refer also to Broadwater's reports on Water and Sediment Quality and Air Quality, which are annexed as Appendix A and Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 30:** *Municipal, industrial, and commercial discharge of pollutants including, but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.*

The Broadwater Project is consistent with this LWRP policy because Broadwater will comply with state and national water quality standards that are applicable to the Broadwater Project. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 5. Refer also to Broadwater's report on Water and Sediment Quality, annexed as Appendix A. See also Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 30A:** *Uses likely to result in the discharge of toxic and hazardous substances are not permitted in the waterfront area.*

The Broadwater Project does not propose any onshore facilities in the waterfront area of Smithtown. Therefore, the Broadwater Project will not result in the discharge of toxic and hazardous substances into the Smithtown waterfront area. Refer to Broadwater's response to Smithtown LWRP Policy 30 above for additional discussion regarding the issues raised by this policy.

**POLICY 31:** *State coastal area policies and purposes of approved local waterfront revitalization programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already overburdened with contaminants will be recognized as being a development constraint.*

Given that the Broadwater Project will not involve review or modification of coastal water classifications or water quality standards, this LWRP policy is not applicable.

**POLICY 32:** *Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high given the size of the existing tax base of these communities.*

The Broadwater Project does not propose to site onshore facilities in Smithtown and therefore this policy is not applicable. Refer to LIS CMP Policy 8 above for discussion regarding Broadwater's waste handling procedures.

**POLICY 33:** *Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.*

The Broadwater Project does not propose to locate its onshore facilities in Smithtown. Therefore, this policy is not applicable. Refer to Broadwater's responses to LIS CMP Policies 5 and 8 above for discussion of stormwater runoff and sewage management practice for Broadwater's on and offshore facilities. Refer also to Broadwater's report on Water



and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

**POLICY 34:** *Discharge of waste materials from vessels into coastal waters will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.*

The Broadwater Project is consistent with this policy because Broadwater will operate in a manner that is protective of significant fish and wildlife habitats and recreational areas. The Broadwater Project is not anticipated to impact water supply areas within the Long Island Sound coastal region.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5, 6, and 8. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 35:** *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

This LWRP policy arguably applies only to the waters within the coastal boundary of Smithtown. The Broadwater Project does not propose any onshore facilities in Smithtown, thereby eliminating the need for dredging in the coastal area. Because the FSRU and interconnecting pipeline will be sited outside of the Smithtown coastal boundary in a distant, offshore location, the Broadwater Project eliminates the need for dredging that would likely be necessary to accommodate the draft of LNG carriers servicing an onshore LNG terminal.

Additional analysis and discussion regarding issues raised by this LWRP policy is set forth in the Project Description set forth in Chapter 2, Section 2.2 *et seq.*, above. *See also* Broadwater's Onshore Facilities Resource Reports, section 1.2 at 1-6, annexed as Appendix O.

**POLICY 35A:** *Dredging to realign channels may be undertaken in the Nissequogue River and Stony Brook Harbor mouth solely if actions will result in less maintenance and minimal impact on environmental resources.*

See Broadwater's response to Smithtown LWRP Policy 35, above.

**POLICY 35B:** *Wetland channels may be realigned only if said action results in enhancing the viability of the wetland area.*

See Broadwater's response to Smithtown LWRP Policy 35, above.

**POLICY 36:** *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

This LWRP policy arguably applies only to the Smithtown coastal boundary. Because Broadwater proposes no onshore facilities for Smithtown and no shipment or storage of petroleum or other hazardous materials in the Smithtown coastal area, Broadwater avoids concerns regarding the protection of Smithtown's coastal waters from spills. Additional analysis of Broadwater's consideration of issues raised by this policy is set forth in Broadwater's response to LIS CMP Policy 8.

**POLICY 36A:** *Non-water dependent uses related to the storage and/or transport of petroleum and oil such as gas stations, fuel oil companies, and chemical storage companies, will be gradually eliminated from the local waterfront area.*

The Broadwater Project does not propose any onshore facilities in Smithtown, including any related to the storage and/or transport of petroleum and oil. Therefore, this LWRP policy is inapplicable to the Broadwater Project.

**POLICY 37:** *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.*

Because there are no onshore facilities proposed for Smithtown, this policy is inapplicable to the Broadwater Project.

**POLICY 37A:** *New development shall not result in greater than zero percent additional stormwater run-off.*

The Broadwater Project does not propose any development in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 38:** *The quality and quantity of surface water and groundwater supplies, will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.*

The Broadwater Project does not propose any onshore facilities in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 38A:** *Uses and/or development which may adversely impact ground and surface waters shall not be permitted in the coastal area.*

The Broadwater Project does not propose any development in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 38B:** *Residential densities for new development will be low unless utilities are provided to protect residents' health and water supply.*

The Broadwater Project does not propose any residential development in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 39:** *The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural lands and scenic resources.*

The Broadwater Project does not propose any transport, storage, treatment or disposal of solid or hazardous wastes within the Smithtown coastal boundary. Therefore, this policy is inapplicable to the Broadwater Project. Refer to Broadwater's responses to LIS CMP Policy 8 above for discussion regarding issues raised by this LWRP policy.

**POLICY 39A:** *The existing ash fill at the Kings Park Psychiatric Center shall not be expanded.*

The Broadwater Project does not propose to expand the existing ash fill at KPPC.

**POLICY 40:** *Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.*

The Broadwater Project will be consistent with this policy, for reasons more fully set forth in Broadwater's response to LIS CMP Policy 5, above.

**POLICY 41:** *Land use or development in the coastal area will not cause national or state air quality standards to be violated nitrates and sulfates [sic].*

Broadwater does not propose land use or development in the Smithtown coastal area. And the Broadwater Project will not cause national or state air quality standards to be violated within the Long Island Sound region, including Smithtown. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's report addressing Air Quality, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 42:** *Coastal management policies will be considered if the State reclassifies land areas pursuant to the Prevention of Significant Deterioration regulations of the Federal Clean Air Act.*

The Broadwater Project will not involve reclassifying land areas pursuant to the PSD regulations of the Federal Clean Air Act. This policy, therefore, will not be applicable to the Broadwater Project.

**POLICY 43:** *Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.*

The Broadwater Project is consistent with this LWRP policy because it will not result in the generation of significant amounts of acid rain precursors nitrates and sulfates.

Additional analysis and discussion confirming the Broadwater Project's consistency with this LWRP policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's report addressing Air Quality Appendix, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 44:** *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

The Broadwater Project will preserve tidal and freshwater wetlands and preserve the benefits derived from these areas because the Broadwater Project does not propose any onshore facilities that would impact such wetlands and the distant, offshore location of the FSRU and interconnection pipeline avoids any impacts to such wetlands. Refer to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O, for additional discussion regarding wetlands.

**POLICY 44A:** *The construction of docks and piers in the Nissequogue River is limited to existing channels and access points to existing yacht clubs.*

The Broadwater Project does not propose the construction of docks or piers in the Nissequogue River. Therefore, this LWRP policy is inapplicable to the Broadwater Project.

### **4.3 Port Jefferson Harbor Complex Harbor Management Plan**

#### **4.3.1 Harbor Issues and Recommendations**

**HARBOR OBJECTIVE #1** *Enhance the commercial waterfront area of lower Port Jefferson Harbor*

**ISSUE 1:** *Public access along the Port Jefferson Village waterfront need to be improved and increased.*

**ISSUE 2:** *Parking and traffic circulation in downtown Port Jefferson Village needs to be improved.*

**ISSUE 3:** *There is no formal municipal presence in the Harbor Complex to orient and inform recreational boaters.*

**ISSUE 4:** *The financing of capital improvements along the Port Jefferson Village waterfront should be prioritized.*

**ISSUE 5:** *The historical significant of lower Port Jefferson Harbor has not been comprehensively assessed.*

The Broadwater Project will be consistent with the goals identified as part of Harbor Objective #1 because the proposed onshore business support facilities that are proposed for Port Jefferson's waterfront area are consistent with the historic and existing mixed uses of the commercial waterfront area and will continue to be used for water-dependent commerce in Long Island Sound. Significantly, the Broadwater Project's onshore facilities in the waterfront area will not impact public access to the Port Jefferson Village waterfront. Broadwater's Port Jefferson waterfront operations will serve the primary, water-dependent purpose of facilitating Broadwater's business by transporting personnel and materials to the FSRU.

Further discussion of Broadwater's proposed onshore facilities in the Village of Port Jefferson is contained in Broadwater's Onshore Facilities Resource Reports, at page 1-7, annexed as Appendix O. Refer also to Broadwater's discussion regarding the applicable zoning and land use patterns and trends analysis, as more fully set forth in section 3.6 and in the Long Island Sound Use Patterns and Trends Analysis, which is annexed as Appendix N, and Broadwater's response to LIS CMP Policies 1, 9, and 10, above.

For all these reasons, the Broadwater Project is consistent with Objective #1 of the Port Jefferson HMP.

**HARBOR OBJECTIVE #2** *Improve Operating Conditions for Water Dependent Recreational, Commercial, and Industrial Uses*

**ISSUE 1:** *Water-dependent uses need to be given priority consideration due to their unique siting requirements and the limited amount of waterfront property that is suitable and available to them.*

**ISSUE 2:** *Commercial fishing support facilities are insufficient and can be improved.*

**ISSUE 3:** *Obtaining permits to dredge is often difficult and time consuming.*

The Broadwater Project will be consistent with the goals identified as part of Harbor Objective #2 because the onshore business support facilities that are proposed for Port Jefferson's waterfront area will enable Broadwater to complete activities that are fundamental to the successful operation of Broadwater's water-dependent business. Importantly, Broadwater's lease of existing buildings and locations will avoid additional competition for the already pressured and limited open space that remains along Port Jefferson's waterfront, which can be used for other water-dependent recreational commercial purposes, including, among others, commercial fishing.

Further discussion of the water-dependency of Broadwater's proposed onshore facilities in the Village of Port Jefferson is contained in Broadwater's Onshore Facilities Resource Reports, pages 1-1 to 1-7, annexed as Appendix O. Refer also to Broadwater's response to LIS CMP Policies 1, 9, and 10 above and to Broadwater's discussion regarding the

applicable zoning and land use patterns and trends in Port Jefferson, as more fully set forth in the Long Island Sound Use Patterns and Trends Analysis at 18, which is annexed as Appendix N.

For all these reasons, the Broadwater Project is consistent with Objective #2 of the Port Jefferson HMP.

**HARBOR OBJECTIVE #3** *Ensure Public and Vessel Safety, and Improve Conditions for Navigation for All Harbor Users*

- ISSUE 1:** *Vessel activities need to be regulated to protect public safety and to minimize user conflicts.*
- ISSUE 2:** *The perimeters of mooring fields and anchorage areas have not been designated in Port Jefferson Harbor and in Setauket Harbor.*
- ISSUE 3:** *There are a number of surface water use conflicts which can be minimized by identifying surface water use areas for certain activities.*
- ISSUE 4:** *Navigation lanes are not well defined or marked.*
- ISSUE 5:** *Improperly designed and sited residential docks can impair navigation and threaten public safety.*
- ISSUE 6:** *There is a need to provide information and assistance to boaters and to provide oversight and enforcement of regulations.*

The Broadwater Project will be consistent with the goals identified as part of Harbor Objective #3 because Broadwater's use of proposed onshore locations in Port Jefferson will be conducted in compliance with all local rules and standard navigational practices to ensure the safety of other vessels and the public.

The use of the proposed waterfront locations in Port Jefferson will facilitate activities that are fundamental to the successful operation of Broadwater's water-dependent business. Importantly, Broadwater's lease of existing buildings and locations in the Port Jefferson area will not result in additional competition for limited, open space along Port Jefferson's waterfront that can be used for recreational purposes or other water-dependent uses.

Further discussion of the water-dependency of Broadwater's proposed onshore facilities in the Village of Port Jefferson is contained in Broadwater's Onshore Facilities Resource Reports, pages 1-1 to 1-7, annexed as Appendix O. Refer also to Broadwater's response to LIS CMP Policies 1, 9, and 10 above and to Broadwater's discussion regarding the applicable zoning and land use patterns and trends in Port Jefferson, as more fully set forth in the Long Island Sound Use Patterns and Trends Analysis, which is annexed as Appendix N.

For all these reasons, the Broadwater Project is consistent with Objective #3 of the Port Jefferson HMP.

**HARBOR OBJECTIVE #4** *Protect and Enhance Environmental Conditions*

**WATER QUALITY ISSUES**

**ISSUE 1:** *Water quality in the Harbor Complex is degraded but can be improved.*

**ENVIRONMENTAL AND ECOLOGICAL ISSUES**

**ISSUE 1:** *The construction, design, and location of residential docks has the potential to adversely impact natural resources and public access.*

**ISSUE 2:** *Shoreline hardening structures (such as seawalls, jetties, groins, revetments) can adversely impact natural resources and may cause scouring of the area seaward and or adjacent to the structure.*

**ISSUE 3:** *Site specific management plans are needed to protect natural resources which are at risk.*

**ISSUE 4:** *Maintaining low residential development densities and large areas of undeveloped public open space in the surrounding upland area can help to protect natural resources and water quality.*

The Broadwater Project will be consistent with the goals identified in Objective #4 because it is protective and respectful of environmental conditions in the Port Jefferson harbor area, including water quality and natural resources.

*Water Quality Issues*

The Broadwater Project recognizes the existence of sensitive water bodies, including Port Jefferson Harbor and Peconic Bay, in the proximity of the proposed onshore facilities in Port Jefferson. The operation of Broadwater's onshore business support operations, including the vessel transport of materials and personnel to the FSRU, will not degrade the quality of the water in the Port Jefferson Harbor area.

Further discussion regarding water quality around Port Jefferson Harbor with Broadwater's proposed onshore facilities in the Village of Port Jefferson is contained in Broadwater's Onshore Facilities Resource Reports, Chapter 2, annexed as part of Appendix O. Refer also to Broadwater's response to LIS CMP Policy 5 above and to Broadwater's report regarding water quality as set forth in Appendix A, for additional discussion regarding Broadwater's compliance with this Objective.

*Environmental and Ecological Issues*

Broadwater will lease existing onshore facilities for onshore operations in the Village of Port Jefferson and does not anticipate constructing residential docks or shoreline hardening structures. Broadwater proposes no construction activities at the Port Jefferson location except for the installation of security fencing and a security check-point at the facility entrance which is not expected to result in impacts on fish, vegetation, or wildlife. Broadwater has considered the fish, vegetation and wildlife that are in the vicinity of the proposed Port

Jefferson location. Broadwater's analysis of these resources is set forth in the Onshore Facilities Resource Reports, Chapter 3, annexed as part of Appendix O.

Broadwater's use of existing locations in the Village of Port Jefferson will preserve public open space to protect natural resources and water quality.

For all these reasons, the Broadwater Project is consistent with Objective #4 of the Port Jefferson HMP.

#### **4.4 Policies of the New York State Coastal Management Program**

**POLICY 1**      *Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.*

The Broadwater Project is consistent with the goals and objectives of this policy because the use of existing facilities for onshore requirements in either of the proposed locations in the Village of Greenport or the Village of Port Jefferson will maintain existing, compatible uses that are an important part of each respective community's character. Refer to Broadwater's response to LIS CMP Policy 1 above for further discussion of the Broadwater Project's compliance with this policy. Refer also to Broadwater's Long Island Sound Use Patterns and Trends Analysis, which is annexed as Appendix N.

**POLICY 2**      *Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.*

The Broadwater Project is consistent with the objectives and goals of this policy because Broadwater's business of serving the target markets with overseas-sourced energy, which requires the transport of LNG to the FSRU for vaporization into natural gas and the delivery of the resulting natural gas to the subsea IGTS pipeline and into the target markets, is water-dependent. In addition, Broadwater's onshore business support facilities that are proposed for the waterfronts in the Village of Greenport and the Village of Port Jefferson will be for the purpose of mooring tugs and enabling the transfer of materials and personnel to the FSRU. Refer to Broadwater's responses to LIS CMP Policy 10 above and Greenport LWRP Policy \_\_\_ for further discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.



**POLICY 3** *Further develop the State's major ports of Albany, Buffalo, New York, Ogdensburg and Oswego as centers of commerce and industry, and encourage the siting, in these port areas, including those under the jurisdiction of State public authorities, of land use and development which is essential to, or in support of, the waterborne transportation of cargo and people.*

The Broadwater Project will not be located within any of the State's major ports (NYSDOS Policy 3 Explanation of Policy: stating that "aim of this policy is to support port development in New York, Buffalo, Ogdensburg, and Oswego"); therefore, this policy is not applicable to the Broadwater Project.

**POLICY 4** *Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those traditional uses and activities, which have provided such areas with their unique maritime identity.*

Refer to Broadwater's response to LIS CMP Policy 1 above Economic Impact Analysis -- and also to its Commercial Fisheries, Recreation, and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, annexed as Appendix F, for further discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 5** *Encourage the location of development in areas where public services and facilities essential to such development are adequate, except when such development has special functional requirements or other characteristics which necessitates its location in other coastal areas.*

The Broadwater Project will be consistent with this policy because the proposed onshore facilities are not anticipated to have unusual or special functional requirements. The existing public services in the Villages of Greenport and Port Jefferson will be adequate to support Broadwater's onshore facilities, if any, that are located there. Broadwater will coordinate with emergency services and other public service departments as necessary to ensure adequate communication regarding Broadwater's onshore business operations. Because of the distant, offshore location that is proposed for the FSRU and interconnecting pipeline, this policy does not apply to these offshore facilities. The Broadwater Project, therefore, will be consistent with this policy, which encourages development "to locate within, contiguous to, or in close proximity to, existing areas of concentrated development where infrastructure and public services are adequate." (NYSDOS Policy 5 Explanation of Policy). For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 6** *Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.*

Since existing onshore facility use will be consistent with current uses, Broadwater does not anticipate that any permits will be required specific to the onshore facilities. See Broadwater's Onshore Facilities Resource Reports, Section 1.6 at 1-7, annexed as Appendix O.

**POLICY 7**      *Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

The Broadwater Project is consistent with the goals and objectives of this policy because it will protect and preserve coastal fish habitats and living marine resources in the coastal area. Refer to Broadwater's response to LIS CMP Policy 6 above for further discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 8**      *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sub-lethal or lethal effect on those resources.*

The Broadwater Project is consistent with the goals and objectives of this policy because it will protect marine and living resources in the coastal area from the introduction of hazardous wastes and other pollutants that can bio-accumulate in the food chain or cause significant sublethal or lethal effect on those resources.

Refer to Broadwater's responses to LIS CMP Policies 6 and 8 as well as Greenport LWRP Policy 8 for further discussion of the Broadwater Project's compliance with this policy. *See also* Section 2.1.2.8.1 regarding the Broadwater Project's waste and waste handling for further discussion and analysis regarding Broadwater's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 9**      *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources. Such efforts shall be made in a manner which ensures the protection of renewable fish and wildlife resources and considers other activities dependent on them.*

The Broadwater Project is consistent with the goals and objectives of this policy. Broadwater's Social Investment Program will consider establishing a social investment fund or foundation for the funding of regional projects that will benefit the environment and the public alike. Such funding could result in, among other things, increased access to existing fish and wildlife resources in Long Island's coastal areas, as well as new or additional resources. A more detailed discussion of Broadwater's Social Investment Program is set forth in Appendix L.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 10** *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities, increasing marketing of the state's seafood products, and maintaining adequate stocks, and expanding aquaculture facilities. Such efforts shall be in a manner that ensures the protection of such renewable fish resources and considers other activities dependent on them.*

The Broadwater Project is consistent with this policy to the extent that the placement of the FSRU in a distant, offshore location preserves and protects existing marine resources, including finfish, shellfish and crustaceans, in the Long Island Sound area.

Refer to Broadwater's response to LIS CMP Policy 6 above for a discussion of the Broadwater Project's compliance with this policy. *See also* Broadwater's Essential Fish Habitat Assessment, which is annexed as Appendix G, and Broadwater's Fishermen Outreach Survey, which is annexed as Appendix H, for additional discussion and analysis establishing Broadwater's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 11** *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this policy.

**POLICY 12** *Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs. Primary dunes will be protected from all encroachments that could impair their natural protective capacity.*

Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this policy.

**POLICY 13** *The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.*

Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this policy.

**POLICY 14** *Activities and development, including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.*

Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this policy.

**POLICY 15** *Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.*

There will be no mining, excavation, dredging or trenching that will significantly interfere with the natural coastal processes that supply beach materials to land adjacent to such waters or result in increased erosion. There is also no dredging expected to occur at the proposed onshore locations to accommodate Broadwater tugs that would interfere with natural coastal processes for near shore locations. The trenching that is required for the construction of the interconnection pipeline will similarly not interfere with natural coastal processes that supply beach materials to land adjacent to such waters. Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 16** *Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long-term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.*

The Broadwater Project will not involve the use of public funds for erosion protective structures; therefore, this policy is not applicable to the Broadwater Project.

**POLICY 17** *Nonstructural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.*

The Broadwater Project is consistent with the goals and objectives of this policy because Broadwater's use of existing buildings for its onshore locations will make use of in-place infrastructure that is unlikely to be subject to flooding and erosion due to the elevation of such buildings above the base flood level. In addition, there is unlikely to be any major construction at the proposed onshore locations. Construction that does occur, if any, will take place on previously disturbed land. It is unlikely that there will be a need to alter the physical location of the primary structures of Broadwater's onshore facilities.

In the event that Broadwater's onshore facilities may be exposed to flooding and erosion, however, Broadwater will, when possible, use non-structural measures to minimize

damage to natural resources and property from flooding and erosion, including the use of vegetation and sand fencing and draining. Refer also to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O. For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 18** *To safeguard the vital economic, social and environmental interests of the State, and of its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the State has established to protect valuable coastal resource areas.*

The Broadwater Project is consistent with the goals and objectives of this policy because it has given full consideration to the economic, social, and environmental interests of the state and its citizens and to the safeguards that the State has established to protect valuable coastal resource areas. Refer to Broadwater's response to LIS CMP Policies 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, and 13 above for a discussion of the Broadwater Project's compliance with this policy. *See also* Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F, for further confirmation of Broadwater's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 19** *Protect, maintain, and increase the level and types of access to public water related recreation resources and facilities.*

The Broadwater Project will be consistent with this policy as it will be protective and respectful of the level and types of access to public water-related recreation as well as historic and natural resources. Refer to Broadwater's response to LIS CMP Policy 9 above for a discussion of the Broadwater Project's compliance with this policy. *See also* Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F, and Broadwater's Marine/Land Use Compatibility Assessment, which is annexed as Appendix E, for further confirmation of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 20** *Access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.*

The Broadwater Project will be consistent with the goals and objectives of this policy because it will not limit access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned. Broadwater's water-dependent business support operations that take place in the Villages of Greenport or Port Jefferson will be consistent with existing waterfront uses in those locations.

Refer to Broadwater's response to LIS CMP Policy 9 above for further discussion of the Broadwater Project's compliance with this policy. *See also* Broadwater's Marine/Land Use Compatibility Assessment, which is annexed as Appendix E.

**POLICY 21** *Water-dependent and water-enhanced recreation will be encouraged and facilitated, and will be given priority over non-water related uses along the coast.*

The Broadwater Project is consistent with this policy because Broadwater's onshore business support operations that will be located in waterfront locations in Greenport or Port Jefferson will be water-dependent, including the mooring of tugs and FSRU support vessels that will transport people and cargo between the shore and the FSRU.

Refer to Broadwater's response to LIS CMP Policies 9 and 10 above for a discussion of the Broadwater Project's compliance with this policy. Refer also to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 22** *Development, when located adjacent to the shore, will provide for water related recreation, whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.*

The Broadwater Project will lease property for its proposed onshore business support facilities on Greenport's or Port Jefferson's waterfront to serve the primary purpose of providing marine transfer of people, equipment, and FSRU support vessels. Because the primary purpose of these onshore facilities will be part of the existing working waterfront, it is unlikely that Broadwater's operations on these leased properties will provide for water-related recreation at such locations. Water-related recreation may be provided elsewhere in the Long Island Sound coastal area, including, Port Jefferson and Greenport, as part of Broadwater's Social Investment Program.

Refer to Broadwater's response to LIS CMP Policy 10 above for a discussion of the Broadwater Project's compliance with this policy. Refer also to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 23** *Protect, enhance and restore structures, districts, areas or sites that are of significance in history, architecture, archaeology or culture of the state, its communities, or the nation.*

The Broadwater Project is consistent with this policy because its proposed location for onshore business support facilities in Greenport does not contain resources listed or eligible for listing in the NRHP or known archaeological sites. Two sites listed on the NRHP –

the Greenport Railroad Station and the Greenport Village Historic District – are directly adjacent to the proposed location from the north and west, respectively. Similarly, the proposed onshore location in Port Jefferson does not contain resources listed or eligible for listing in the NRHP or known archaeological sites. Two sites listed on the NRHP – Bayles Shipyard (99NR01545) and the Port Jefferson Village Historic District (02NR04918) – are located immediately east and southeast of the Port Jefferson location.

For additional discussion regarding the existing site conditions pertaining to historic, archaeologic, and cultural resources, refer to Existing Site Conditions, Chapter 3.4.2, above. Refer also to LIS CMP Policy 2, above and to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 24**     *Prevent impairment of scenic resources of statewide significance.*

There are no areas that have been designated scenic areas of statewide significance (SASS) as defined in Article 42 of the Executive Law in Long Island Sound or the vicinity of the Broadwater Project. Broadwater completed a VRA, which evaluated multiple potentially sensitive visual receptors in the vicinity of the Broadwater Project. The VRA is annexed as Appendix K. Additional discussion regarding Broadwater's inventory of potentially sensitive receptors is set forth in Broadwater's response to LIS CMP Policy 3.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 25**     *Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance but which contribute to the overall scenic quality of the coastal area.*

There are no areas that have been designated SASS as defined in Article 42 of the Executive Law in Long Island Sound or in the vicinity of the Broadwater Project. Broadwater completed a VRA, which evaluated multiple potentially sensitive visual receptors -- including those not identified as SASSs but that contribute to the overall scenic quality of the coastal area - in the vicinity of the Broadwater Project. The VRA is annexed as Appendix K. Broadwater's VRA establishes that the Broadwater Project is respectful of natural and man-made resources that contribute to the overall scenic quality of New York's coastal area.

By way of example and without limitation, Broadwater considered the potentially sensitive visual resources and vantage points within the Town of Riverhead as part of its recently-completed VRA. (See VRA, Appendix K). In fact, Broadwater evaluated the visibility of the FSRU from 13 potentially visually sensitive receptors in the Town of Riverhead. All the shoreline receptors in the Town of Riverhead will view the FSRU within the far background distance zone within the range of 14.9 miles from the FSRU at Future Jamesport State Park to 9.1 miles from the FSRU at the Creek Boat Ramp (VP# 12B and LI23, respectively). While the FSRU may be visible at times from these receptors in the Town of Riverhead, its visibility will be limited largely as a result of its offshore location; at these distances, elements will lose detail and become less distinct. Broadwater compiled photo simulations from multiple potentially sensitive receptor locations that depict the existing condition (i.e., without the Broadwater Project) and the proposed condition (i.e., with the Broadwater Project). These photo simulations are included as part of Broadwater's VRA. In particular, Broadwater completed photo simulations for Iron Pier Beach (14.3 miles from FSRU) (see Appendix K, Figures A-6A, A-6B, A-6C, A-6D, A-6E, A-6F (VP-LI3); Roanoke Avenue Beach (11.1 miles from FSRU) (Appendix K, Figures A-7A, A-7B, A-7C (VP-LI14); Wildwood State Park -- Trail Overlook (9.5 miles from FSRU) (Appendix K, Figures A-8A, A-8B, A-8C (VP-LI20); and Wading River Beach (9.2 miles from FSRU) (see Appendix K, Figures A-9A, A-9B, A-9C, A-9D, A-9E, A-9F (VP-LI22). These photo simulations confirm that the Broadwater Project will be consistent with features that already exist in Riverhead's view shed and will not create an unusually discordant feature on the Sound. When visible, the Broadwater Project will generally appear as a small two-dimensional rectilinear form on the horizon from the distant coastal vantage points in the Town of Riverhead. While the outline of the Broadwater Project will break the visible horizon from the distant



coastal vantage points in the Town, the FSRU will appear quite low and, as distance increases, increasingly more difficult to distinguish from the horizon.

As part of its VRA, Broadwater also considered the potentially sensitive visual resources and vantage points within the Town of Brookhaven. (See VRA, Appendix K). In fact, Broadwater evaluated the potential visibility of the FSRU from 21 potentially visually sensitive receptors in the Town of Brookhaven. The FSRU will not be visible from thirteen of these receptors. In addition, while the FSRU may be visible from other receptors in the Town of Brookhaven, its visibility is limited largely as a result of its offshore location. For those shoreline receptors in the Town of Brookhaven that will view the FSRU within the far background distance zone, the FSRU will be between the range of 13.8 miles from the Mt. Sinai Historic District to 9.6 miles from Shoreham Beach. At these distances, elements will lose detail and become less distinct. Broadwater has compiled photo simulations from multiple potentially sensitive receptor locations that depict the existing condition (i.e., without the Broadwater Project) and the proposed condition (i.e., with the Broadwater Project). These photo simulations are included as part of Broadwater's VRA. In particular, Broadwater completed photo simulations for Shoreham Beach (see Appendix K, Figures A-10A, A-10B, A-10C (VP-LI24) and Cedar Beach/Mt. Sinai Harbor (Appendix K, Figures A-11A, A-11B, A-11C (VP-LI11A)). As with Riverhead, these photo simulations confirm that the Broadwater Project will be consistent with features that already exist in Brookhaven's view shed and will not create an unusually discordant feature on the Sound. When visible, the Broadwater Project will generally appear as a small two-dimensional rectilinear form on the horizon from the distant coastal vantage points in the Town of Brookhaven. While the outline of the Broadwater Project will break the visible horizon from the distant coastal vantage points in the Town, the Project will appear quite low and, as distance increases, increasingly more difficult to distinguish from the horizon.

Broadwater also considered the potentially sensitive visual resources and vantage points within the Town of Smithtown as part of its recently-completed VRA. (See VRA, Appendix K). The FSRU will not be at all visible from Nissequogue State Park and the Sunken Meadow State Park, 24.2 and 25.1 miles from the FSRU, respectively (VP# LI48 and LI49, respectively).

As to those areas along the coast from which the FSRU and/or transiting LNG carriers will be visible as stationary or temporary features on the Sound, for those who recognize and understand that the Sound is a multi-purpose water body, the presence of the FSRU and LNG carriers will have little impact on their recreational experience. These features are consistent with already existing facilities and vessels on the Sound. **See also WSR § 2.2.1.1.** And while the presence of the FSRU and LNG carriers may diminish the aesthetic experience for those who believe that the Sound should be used strictly for recreational purposes during the operational life of the Broadwater Project, such a view is inconsistent with the Sound's historic and present use as a multi-purpose waterbody that simultaneously supports commerce, industry and recreation.

An important factor regarding the FSRU's visibility within the Sound is that it will be a temporary not permanent, feature on the waters. The decommissioning of the FSRU by its complete removal at the end of its useful life is a most favored fact in demonstrating

compliance with the NYSDEC Visual Policy. The mooring tower may similarly be decommissioned or, alternatively, converted to a navigation aid.

Refer to Broadwater's discussion regarding the completed inventory of more than 100 potentially sensitive receptors, including those that contribute to the overall scenic quality of the Long Island Sound coastal community, as set forth in Broadwater's response to LIS CMP Policy 3.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 26**     *Conserve and protect agricultural lands in the state's coastal area.*

The Broadwater Project will not impact the agricultural lands in the eastern Suffolk County portion of Long Island Sound's coastal area. First, the LNG terminal's siting location many miles off the Sound's coastline will not at all impact the Sound's existing onshore agricultural lands. Second, the onshore facilities associated with the Broadwater Project will be located in already existing sites that are commercially/industrially zoned and, thus, will not compete with Suffolk County's agricultural lands or open spaces. As such, this policy is not applicable to the Broadwater Project.

**POLICY 27**     *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment, and the facility's need for a shorefront location.*

Refer to Broadwater's response to LIS CMP Policies 10 and 13 above for a discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 28** *Ice management practices shall not interfere with the production of hydroelectric power, damage significant fish and wildlife and their habitats, or increase shoreline erosion or flooding, or interfere with the production of hydroelectric power.*

Broadwater is not anticipated to require ice management practices due to the constant circulation of the Sound's waters. In the coastal areas of Port Jefferson and Greenport, where Broadwater's proposed onshore facilities will be located, the ports are active all year long, with commercial activity continuing through the winter months.

**POLICY 29** *Encourage the development of energy resources on the outer continental shelf, in Lake Erie and in other water bodies, and ensure the environmental safety of such activities.*

The Broadwater Project is consistent with this policy because it will introduce a new supply of natural gas into the target markets, using the abundant and vast waters of Long Island Sound. Broadwater's selected location for its LNG terminal and interconnection pipeline in the central portion of Long Island Sound avoids certain safety issues that could otherwise be relevant to an onshore LNG facility. Here, the nearest coastal community will be a minimum of 9 miles from the FSRU. The Broadwater Project is also protective of and is taking multiple measures to protect the natural resources of Long Island Sound.

Additional discussion regarding the Broadwater Project's consistency with this policy is set forth in Broadwater's responses to LIS CMP Policies 1, 5, 8, and 13, above. Refer also to Broadwater's reports on Water and Sediment Quality and Air Quality, which are annexed as Appendix A and Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 30** *Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.*

The Broadwater Project is consistent with this policy because Broadwater will comply with state and national water quality standards that are applicable to the Broadwater Project. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5 and 8. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 31**     *State coastal area policies and management objectives of approved Local Waterfront Revitalization Programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already overburdened with contaminants will be recognized as being a development constraint.*

Given that the Broadwater Project will not involve review or modifying coastal water classifications or water quality standards, this policy is not applicable to the Broadwater Project.

**POLICY 32**     *Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.*

The Broadwater Project is consistent with this policy, for reasons set forth in LIS CMP Policy 8, above.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 33** *Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.*

The Broadwater Project is consistent with this policy because Broadwater will use best management practices to control stormwater runoff and combined sewer overflows draining into coastal waters for any onshore facilities. In addition, because Broadwater will be using existing facilities for its proposed onshore locations, no water quality impacts from construction or operation of the proposed onshore facilities are anticipated.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5 and 8, above. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 34** *Discharge of waste materials into coastal waters from vessels subject to state jurisdiction will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.*

The Broadwater Project is consistent with this policy because Broadwater will operate in a manner that is protective of significant fish and wildlife habitats and recreational areas. In addition, the Broadwater Project is not anticipated to impact water supply areas within the Long Island Sound coastal region.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5, 6, and 8. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 35** *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

Because the FSRU will be placed in a distant, offshore location, the Broadwater Project eliminates the need for dredging that would likely be necessary to accommodate the draft of LNG carriers servicing an onshore LNG terminal. No dredging at the existing facilities in the onshore locations to accommodate tugs or other vessels is anticipated as a result of the Broadwater Project.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in the Project Description set forth in Chapter 2, Section 2.2 *et seq.*, and in Broadwater's responses to LIS CMP Policies 1 and 5, above. *See also* Broadwater's Onshore Facilities Resource Reports, Section 1.2 at 1-5 to 1-6, which is annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 36** *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

The Broadwater Project is consistent with this policy as Broadwater will employ multiple measures to ensure the proper storage and shipment of petroleum and other hazardous materials to prevent or minimize the potential for spills into coastal waters. For proposed onshore facilities located in the Villages of Greenport and Port Jefferson, there will be no bulk storage of fuel required. Material handling at the waterfront facilities will involve the transfer of certain containerized liquids, such as aqueous ammonia and mercaptan. The liquid transfers would be facilitated by the use of 20-foot isotanks to ensure the safe transfer of such materials and minimize the potential for a spill or discharge. The onshore facilities will also provide an emergency response center for the Broadwater Project to ensure that the cleanup of unexpected, accidental discharges is expedited.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 1, 5, 6, 8. *See also* Broadwater's Onshore Facilities Resource Reports, at pages 1-1 to 1-7, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 37** *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.*

The Broadwater Project is consistent with this policy as Broadwater will employ multiple measures to minimize non-point discharge of excess nutrients, organics, and eroded soils into coastal waters. The proposed locations for onshore are already developed, paved locations. The Broadwater Project will not result in significant movement of land or excavation of these already developed locations. As such, the Broadwater Project will not result in uncontrolled or excessive non-point discharge of nutrients, organics and eroded soils into the coastal waters.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5 and 8.

See also Broadwater's Onshore Facilities Resource Reports, at pages 1-1 to 1-7, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 38**     *The quality and quantity of surface water and groundwater supplies will be conserved and protected particularly where such waters constitute the primary or sole source of water supply.*

The Broadwater Project is consistent with the objectives of this policy because the proposed onshore business support facilities and related operations are not anticipated to result in impacts to the surface water or groundwater supplies. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5 and 8. See also Broadwater's Onshore Facilities Resource Reports, at pages 2-1 to 2-3, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 39**     *The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within the coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural land, and scenic resources.*

The Broadwater Project will be consistent with this policy because any transportation, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within the coastal areas in Greenport and Port Jefferson will be protective of groundwater and surface water supplies, fish and wildlife habitats, recreation areas, agricultural lands, and scenic resources. A discussion of the fish, vegetation and wildlife habitat that exists at the proposed Greenport and Port Jefferson locations for Broadwater's onshore facilities is set forth in Broadwater's Onshore Facilities Resource Reports, Section 3.1 at 3-1 to 3-8, annexed as Appendix O. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5 and 8.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 40**     *Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.*

The Broadwater Project will be consistent with this policy, for reasons more fully set forth in Broadwater's response to LIS CMP Policy 5, above.

**POLICY 41**      *Land use or development in the coastal area will not cause national or state air quality standards to be violated.*

The Broadwater Project is consistent with this policy because it will not cause national or state air quality standards to be violated. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's Air Quality, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 42**      *Coastal management policies will be considered if the state reclassifies land areas pursuant to the prevention of significant deterioration regulations of the Federal Clean Air Act.*

The Broadwater Project will not involve reclassifying land areas pursuant to the PSD regulations of the Federal Clean Air Act. Therefore, this policy is not applicable to the Broadwater Project.

**POLICY 43**      *Land use or development in the coastal area must not cause the generation of significant amounts of acid rain precursors nitrates and sulfates.*

The Broadwater Project is consistent with this policy because it will not result in the generation of significant amounts of acid rain precursors nitrates and sulfates. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's Air Quality report, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.



**POLICY 44**     *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

The Broadwater Project is consistent with this policy because there are no freshwater wetlands or NWI wetlands within or adjacent to the proposed locations for onshore facilities. Due to the distant, offshore location of the FSRU and interconnecting pipeline, these facilities will not impact any wetlands.

Refer also to Broadwater's Onshore Facilities Resource Reports, Section 3.1 at 3-1 and 3-8, annexed as Appendix O, for additional discussion regarding Broadwater's consistency with this policy. Refer also to Broadwater's response to LIS CMP Policy 6, above.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

#### 4.5 Statement of Coastal Zone Consistency

The Coastal Zone Management Act (CZMA) declares that the public policy of the State within the coastal area is "...to achieve a balance between economic development and preservation that will permit the beneficial use of coastal resources while preventing the loss of living marine resources and wildlife, diminution of open space areas or public access to the waterfront, shoreline erosion, impairment of scenic beauty, or permanent damage to ecological systems" (N.Y. Exec. Law § 912). For all of the reasons set forth in Broadwater's consistency analysis herein, the Broadwater Project's balancing of economic development and environmental considerations is fully consistent with the policies of New York State's Coastal Management Program, including, more particularly, those 13 specific policies under the LIS CMP as well as the other potentially applicable LWRPs and HMPs discussed herein.

## **APPENDIX E**

### **MARINE/LAND USE COMPATIBILITY ASSESSMENT**

**REVISED**  
**AprilOctober 2006**

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## **1.0 MARINE USE**

### **1.1 General Description of Long Island Sound Coastal Region and Marine Resources**

Long Island is the largest island adjoining the continental United States, extending approximately 118 miles (190 km) east-northeast from the mouth of the Hudson River. Totalling 1,377 square miles (3,580 km<sup>2</sup>) of land area, Long Island is divided into four counties: Kings (Brooklyn), Queens, Nassau, and Suffolk. The proposed floating storage regasification unit (FSRU) site and subsea pipeline route ~~are~~is located in Suffolk County, New York.

Land uses along the coastal areas of Long Island vary primarily according to the location on the island. The population and overall development is generally less dense on the eastern coastal areas of Long Island, including the area directly south of the proposed Project as well as areas to the east (i.e., eastern Suffolk County). Suffolk County's five eastern towns (Riverhead, Southampton, Southold, East Hampton, and Shelter Island) had a combined estimated population of 136,850 in 2004, or only 9% of the County's population, but occupy 42% of the county's land area. The estimated population of Suffolk County was 1,475,488 in 2004, and the Town of Brookhaven (estimated population 471,291) is Suffolk County's most populous town. The estimated population of Nassau County, which is immediately west of Suffolk County, was 1,339,641 in 2004.

The coastal area of eastern Suffolk County is much less urbanized than the western portion of the County. Eastern Long Island comprises a mix of agriculture, open space, and rural/low-density residential development. Some densely developed commercial/industrial uses occur along eastern Long Island, outside of organized maritime centers; however, most urban development occurs in the defined maritime centers such as Port Jefferson and Greenport (*see* Figures 1-1 and 1-2).

Regional land use patterns in the upland areas comprising the four larger towns traversed by the Suffolk County north shore watershed boundary are mixed. Residential development comprises 53% of the watershed acreage, with the majority of that category being low-density residential (*see* Table E-1).

**Table E-1 Regional Land Use in Towns Traversed by the Suffolk County North Shore Watershed Boundary**

	Huntington	Smithtown	Brookhaven	Islip	Total	Percent
Low-density residential	7,316	4,630	2,817	24	14,787	28.50%
Medium-density residential	3,415	4,198	3,854	134	11,601	22.30%
High-density residential	571	218	234	0	1,023	2.00%
Commercial	324	295	274	10	903	1.70%
Industrial	34	185	36	0	255	0.50%
Institutional	776	1,028	1,390	141	3,335	6.40%
Recreation and Open Space	4,279	4,670	1,283	55	10,287	19.80%
Agriculture	86	197	96	0	379	0.70%
Vacant	1,290	1,053	953	1	3,297	6.30%
Transportation	1,833	1,910	1,621	39	5,403	10.40%
Utilities	416	53	171	6	646	1.20%
Waste Handling and Management	0	19	6	0	25	0.10%
Freshwater surface	22	5	9	0	36	0.10%
<b>Total</b>	<b>20,362</b>	<b>18,461</b>	<b>12,744</b>	<b>410</b>	<b>51,977</b>	<b>100.00%</b>

Source: Suffolk County 2004.

### **Marine Resources and Potential Marine Use Conflicts in Long Island Sound**

The proposed Project will be located in an open-water environment in Long Island Sound. The land use within which the offshore Project will be constructed and operated is designated entirely as open water. Onshore components of the Project will be located in waterfront locations with various land use designations (*see* Section 2). The offshore Project area falls under certain jurisdictions of the State of New York as the Project is entirely located within the New York portion of Long Island Sound. A summary of the entire Project area, including marine resources identified in the Sound and in the Race, as well as the proposed FSRU location and liquefied natural gas (LNG) carrier transit route, is presented on Figures 1-1, 1-2, and 1-2.1. The Race is the eastern entrance to Long Island Sound, between Fisher's Island and Gull Island, including Valiant Rock. (*see* Resource Report No. 8, Land Use, Recreation and Aesthetics, incorporated herein by reference). ~~Because the~~The U.S. Coast Guard ~~has not defined the required,~~ in its Waterways Suitability Report (2006), recommended the greatest extent of the safety and security zone for the Project, ~~the summary map and overall assessment assumes conservatively that the safety and security zone will be approximately 1,000~~ as being 1,210 yards



as referenced to the center of the mooring tower. The U.S. Coast Guard ~~will~~ also ~~establish~~established a traveling safety and security zone for the LNG carrier as it transits to the FSRU. ~~Broadwater assumes conservatively that the U.S. Coast Guard imposed~~The moving safety and security zone ~~will be approximately 2~~is recommended to be 2 nautical miles ahead, 1 nautical mile behind, and ~~880~~750 yards ~~onto~~ either side of the LNG carrier. An assessment of resources located in the vicinity of the proposed FSRU location, the ~~preliminary~~ LNG carrier transit routes, and the onshore portions of the Project are presented in this document. The assessment also identifies any potential conflicts or compatibility issues with marine and land uses in Long Island Sound and the resulting impact.

### 1.1.1 Shipping Routes and Designated Navigable Waters

As the primary thoroughfare for accessing the commercial/industrial ports along the coast of Long Island and Connecticut, Long Island Sound continues to support a significant amount of commercial vessel traffic. In fact, approximately 46 million tons of petroleum and coal are currently moved annually by ship in the Sound. Navigation-dependent activities are very important to the economies of New York and Connecticut and comprise a significant portion of the use of the main body and port areas of Long Island Sound. Broadwater purposely sited the FSRU and interconnecting pipeline to avoid ~~impacts~~and minimize effects on other water-dependent businesses and activities. The Coast Guard's conclusions in the Waterways Suitability Report demonstrate the Project's avoidance and minimization of these effects.

There are no official vessel traffic routes in Long Island Sound. In the absence of a routing scheme in the Sound, reliance on federal navigational aides and the use of standard marine practice have led to the development of de facto traffic patterns and generalized shipping routes in the Sound. The generalized shipping routes illustrated on Figure 1-3 were identified by the U.S. Coast Guard as part of its Ports and Waterways Assessment (PAWSA) (U.S. Coast Guard 2005) conducted for Long Island Sound in May of 2005. The figure presents vessel routes identified using global positioning systems (GPS) onboard vessels that travel the Sound. While the figure may not depict all routes utilized by vessels, it does identify the primary routes utilized by commercial vessels in the Sound as determined by the U.S. Coast Guard. Maintained navigation channels are restricted to nearshore areas and within the rivers and harbors along the

Sound. The locations of ports within the Sound and the presence of Stratford Shoal, which is centrally located in the Sound, largely dictate the specific paths that shipping follows in the Sound (*see* Figure 1-1). Following the installation of the FSRU and pipeline, all navigation maps for the Sound would be updated to include both the FSRU location and the specific safety and security zone surrounding the facility, as designated by the U.S. Coast Guard.

The FSRU will be a permanent navigation constraint during its operational lifetime. **However, as noted by the U.S. Coast Guard in the Waterways Suitability Report, the proposed location for the FSRU would not be within the predominance of existing commercial and recreational uses of the Sound.** Construction of the pipeline that interconnects the FSRU with the existing Iroquois Gas Transmission System (IGTS) pipeline could result in a short-term impact on navigation due to the presence of construction vessels on the Sound. Navigational warnings and precautions will be implemented so as to not impede vessel traffic during the period required for pipeline construction and installation of the mooring structure. In addition, Broadwater will coordinate with the U.S. Coast Guard, and a Notice to Mariners will be issued with installation details. Construction vessels associated with the Project will maintain an open line of communication with all vessels during construction and installation activities.

### **Potential Marine Use Compatibility Issues**

As shown on Figure 1-4, there is a potential conflict between the historic shipping route that traverses the central portion of the Sound and establishment of the U.S. Coast Guard-required safety and security zone around the FSRU. The ~~1,000~~**recommended 1,210**-yard safety and security zone would overlap with a portion of this vessel transit route based on the transit data provided by the U.S. Coast Guard.

However, given the width of the shipping route, as demonstrated by the U.S. Coast Guard data **and the findings of the Waterways Suitability Report**, this minor conflict is manageable. Large commercial vessels transiting the Sound are controlled by local pilots who are aware of all navigational constraints in the Sound. Therefore, these vessel pilots would be well aware of constraints associated with the FSRU and the U.S. Coast Guard-designated safety and security zone and could modify their course of transit accordingly. By having the

Broadwater facility located in the widest portion of the Sound, there is ample space to allow for navigation outside ~~any established~~ the U.S. Coast Guard's recommended safety and security zone.

### 1.1.2 Subsea Utilities

Several cables, pipelines, and other utilities traverse the bottom of Long Island Sound. These utilities are largely buried beneath the seafloor except in specific locations where rock or other obstructions prevent complete burial. The Project's pipeline will cross subsea rights-of-way and other designated uses between the FSRU and IGTS tie-in location. These crossings are described below. Impacts on these existing subsea utilities will be temporary and limited to the construction phase of the Project.

- **Cross Sound Cable.** This submarine power cable traverses the Sound from New Haven, Connecticut, to Shoreham, New York. The proposed Broadwater pipeline route will require a single crossing of this cable.
- **AT&T Cable Corridor.** This submarine fiber-optic telecommunications cable corridor traverses the Sound from Shoreham, New York, to East Haven, Connecticut. The proposed Broadwater pipeline route crosses the corridor and associated cables.
- **IGTS Pipeline.** This pipeline runs from Northport, New York, to Milford, Connecticut. A subsea connection to this pipeline will be the terminus of the proposed Broadwater subsea pipeline.
- **MCI Cable Corridor.** This fiber-optic telecommunications cable corridor runs from Rocky Point, New York, to Madison, Connecticut. It is located east of the proposed FSRU location.
- **Cross Island Cables.** These seven power cables are contained within a corridor that crosses Long Island Sound from Northport, New York, to Norwalk, Connecticut. The corridor is located west of the proposed Broadwater pipeline's western terminus at the IGTS pipeline.
- **Flag Atlantic-1 North Cable.** This trans-Atlantic fiber-optic telecommunications cable extends from Northport, New York, to England. The portion of the cable in Long Island Sound runs south of the New York/Connecticut border and provides a direct communication link between New York City, London, and Paris. This cable is located south of the proposed Broadwater pipeline route and will not be impacted by the Broadwater Project.

- **IGTS Eastchester Extension.** This pipeline runs east-west in the Sound from Northport to Eastchester, New York, west of the Broadwater Project area.
- **Islander East Pipeline.** This proposed pipeline is routed to the east of the Broadwater Project area.

### **Potential Marine Use Compatibility Issues**

There are no anticipated conflicts or compatibility issues with existing utilities in Long Island Sound from either the FSRU or LNG carriers, ~~and~~or the associated safety and security zones, as these utilities are located beneath the seafloor. ~~Regardless of~~With the size of the 1,210 yard safety and security zone designated recommended by the U.S. Coast Guard for the FSRU, existing facilities will be located well outside of the safety and security zone, allowing normal maintenance operations to occur as required, with no impact on either the Broadwater Project or the individual utilities. Installation of the Broadwater pipeline will create an additional utility right-of-way within the Sound that will need to be depicted on navigation charts to avoid future impacts. While the pipeline will require a new right-of-way, the extensive field investigations conducted by Broadwater demonstrate that, with the exception of Stratford Shoal, the bottom substrate is largely homogenous across the 21.7-mile length of the proposed pipeline. In addition, the substrate offers no unique habitat value, and installation of the pipeline will not impact the health of the Sound's ecosystems. Where the pipeline route traverses Stratford Shoal, which is largely characterized by a cobble substrate, the pipeline will be protected with rock or other imported fill material, which will not result in adverse impacts on any other existing marine uses.

#### **1.1.3 Commercial Fishing/Designated Fishing Grounds**

##### **Commercial Fishing**

Long Island Sound has numerous areas that traditionally have been high-use fishing grounds and fishery areas. Shellfishing tends to predominate in the shallower nearshore Connecticut waters, while lobster fishing and finfishing predominate in the deeper central portions of the Sound. Whereas the nearshore shellfishing grounds are established through defined leases with the states, the finfish, and lobster industries tend to operate under informal agreements with regard to specific areas fished. Much of the nearshore area along the

Connecticut coastline in proximity to the FSRU is designated for oyster and clam leases (*see* Figure 1-1). In New York, the New York State Department of Environmental Conservation (NYSDEC) has designated offshore areas in Long Island Sound as Marine Use Assignment Areas, which are located close to the New York shoreline, away from both the proposed FSRU location and subsea pipeline route. Marine Use Assignments are 5-acre parcels within which NYSDEC permits use by shellfishermen for off-bottom culture of shellfish. Hard clams and Eastern oyster are the most actively fished commercial species in the region, accounting for more than 74% of the total revenues in 2001. Given Broadwater's location in the deeper waters of the central Sound, impacts to the hard clam and oyster industries are avoided, thus preserving the most economically important component of the commercial fishery.

Historical use maps of the Sound prepared by the Connecticut Department of Environmental Protection (CTDEP) indicate that nearly all of the western two-thirds of the Sound, including the area being considered for the FSRU and pipeline, are classified as a high-use lobster fishery area. Although lobstermen are required to renew permits on a yearly basis, the state agencies do not provide leases for particular portions of the Sound. Rather, territories have been determined largely through historic usage and informal agreements between the fishermen.

Historically, the lobster fishery was a significant part of the shellfish industry in the Sound; however, lobster catches have decreased significantly in recent years because of a die-off that began in 1998. Despite the lobster die-off that has occurred in recent years, the Project area continues to be heavily fished for lobsters. Finfishing also takes place throughout the Sound, although trawl fishing is limited because of the density of lobster pots throughout the Sound.

For the years leading up to the die-off, lobstermen throughout Long Island Sound landed an average of 10 million pounds (4.5 million kilograms) of lobster per year, with a total value of \$32 million annually. Since the die-off, the landings have fallen to 1.44 million pounds (650,000 kg), and the value has declined to approximately \$5.1 million. As a result, several lobstermen have chosen to pursue finfish and shellfish after modifying their vessels and gear, while others have dropped out of the industry. Tables E-2 and E-3 summarize the top five

commercial fish landings, in terms of dollars, for New York and Connecticut for the years 2002 and 2003.

**Table E-2 Top Five Commercial Fishing Landings, in Terms of Dollars, for New York and Connecticut (2002)**

Location of Species	Pounds	Value	Price per Pound
<b>New York</b>			
Quahog clam	1,501,752	\$12,244,654	\$8.15
Longfin squid	9,613,411	\$6,246,554	\$0.65
Atlantic surf clam	8,543,690	\$5,519,822	\$0.65
American lobster	1,440,483	\$5,131,295	\$3.56
Eastern oyster	536,958	\$4,994,990	\$9.30
<b>Connecticut</b>			
Quahog clam	3,434,844	\$9,202,241	\$2.70
Sea scallop	1,578,640	\$6,399,897	\$4.05
American lobster	1,067,121	\$4,225,522	\$3.96
Eastern oyster	246,669	\$2,012,161	\$8.16
Longfin squid	1,778,266	\$1,178,428	\$0.66

Source: National Oceanic and Atmospheric Administration (NOAA) Fisheries Department (NOAA Fisheries) 2005.

**Table E-3 Top Five Commercial Fishing Landings, in Terms of Dollars, for New York and Connecticut (2003)**

Location of Species	Pounds	Value	Price per Pound
<b>New York</b>			
Quahog clam	1,552,946	\$12,399,024	\$7.98
Atlantic surf clam	13,263,570	\$7,934,420	\$0.60
American lobster	946,449	\$4,426,316	\$4.68
Longfin squid	4,602,936	\$4,353,264	\$0.95
Eastern oyster	466,117	\$4,262,701	\$9.15
<b>Connecticut</b>			
Quahog clam	4,038,021	\$10,469,996	\$2.59
Sea scallop	1,907,675	\$8,124,639	\$4.26
American lobster	671,119	\$3,170,088	\$4.72
Eastern oyster	279,414	\$2,273,760	\$8.14
Silver hake	2,453,756	\$1,460,245	\$0.60

Source: NOAA Fisheries 2005.

## **Lobster Fishing**

Throughout Long Island Sound, fishing occurs according to territories established through cooperative agreements between and among the fishermen. Lobster fishing and other fishing utilizing fixed gear is ubiquitous throughout the Sound, with very high lobster pot densities in some areas. Lobster pots are usually set in a series, with 5 to 15 traps being most common. The pots are strung on a ground line about 60 to 100 feet apart. Buoys marking these lines of lobster pots can be set at intervals of 500 feet or less. Based on an average of 10 pots per line and 500-foot intervals between buoys, lobster pot densities could be as high as 1,000 per square mile. However, given the overall reduction in lobster pots that has occurred in the last 7 years, the actual number of traps set in any given area is likely to be considerably less. NYSDEC estimates that approximately 110,910 lobster traps were set in all of Long Island Sound (including the East End) in 2004 (*see* Table E-4). Based on this data, 32,336 lobster traps were set in eastern Long Island Sound (where the FSRU would be located) in 2004. This represents a



decrease of approximately 76,000 traps from 1998 (i.e., prior to the significant lobster die-off in the Sound) when 108,413 traps were set.

**Table E-4 Lobster Trap Use Reported on Annual Recall Survey**

Year	Western Long Island	Eastern Long Island	East End	Total Long Island Sound
1998	162,457	108,413	28,926	299,795
1999	161,910	102,024	40,447	304,381
2000	81,835	80,065	30,406	192,306
2001	80,708	71,205	24,095	176,007
2002	57,207	65,862	21,556	144,624
2003	40,307	36,011	12,654	88,971
2004	52,971	32,336	25,604	110,910

Source: NYSDEC 2005.

### **Trawling Lanes/Finfishing**

In order to avoid conflict between fishermen using fixed gear and fishermen who trawl, specific areas have been agreed upon as trawling lanes. In general, trawling is limited in the Sound due to the predominance of fixed-gear lobster fishing. Trawling lanes were identified during the initial consultation with local fisherman and through information presented in the *Environmental Impact Statement for the Designation of Dredge Material Disposal Sites in Central and Western Long Island Sound, Connecticut and New York* (EPA 2004). Designated trawling lanes in Long Island Sound are shown on Figure 1-5. **See also Waterways Suitability Report at § 3.1.2.3.1.**

Lobster fishermen report fishing 12 months of the year, with two peak periods, one in the spring/summer (beginning sometime between February and April and continuing through August) and one in the fall/early winter (late October through December). Fishermen who trawl reported fishing from April to June, August to October, and December to January. Table E-5 provides a summary of the species fished, gear type, and fishing periods reported by fishermen interviewed during the survey.

**Table E-5 Species Fished, Gear Used, and Fishing Periods**

Species Fished	Gear	Fishing Periods
Lobster	Lobster traps/pots	12 months (beginning sometime between February and April and continuing through August, and in late October through December; peak in the spring/summer)
Primary lobster by-catch: tautog (blackfish), black sea bass	Lobster traps/pots	
Other lobster by-catch: scup (porgies), conch, squid, summer flounder	Lobster traps/pots	
Tautog (blackfish)	Fish pots	
Conch	Conch pots	
Scup (porgies), summer flounder, tautog (blackfish), bluefish, striped bass, squid, flounder, and butterfly	Fish traps, nets, hook and line	12 months (target species change with seasons)
Scup (porgies), summer flounder, tautog (blackfish), bluefish, striped bass, squid, flounder, and butterfly	Trawl	Focused efforts from April to June, August to October, and December to January (target species change with seasons)

Broadwater undertook a fishermen's outreach program for the proposed Project in order to identify interested parties that utilize the Sound for commercial and recreational fishing and to identify those that may be impacted by the Project. (*see* Appendix F). Information obtained from commercial and recreational fishermen through a telephone survey included: areas fished in Long Island Sound, targeted species, gear type, seasons fished, and concerns related to the proposed Project. The outreach program also included review of information provided by NOAA Fisheries related to catch in the Project area.

The majority of interviewed commercial fishermen (> 90%) target lobster with fixed gear (lobster pots/traps). This corresponds with reports of lobster fishing dominating the commercial fishing industry in Long Island Sound. Approximately half of the lobster fishermen target only lobster and half also harvest finfish.

A discussion of the potential marine conflicts and economic impacts associated with removal of areas fished is discussed below. A comprehensive economic impact analysis discussing impacts on commercial fisheries is presented in Appendix F, and the Fisherman Outreach Study is provided in Appendix H.

## Potential Marine Use Compatibility Issues

### Lobster Fishery

~~By estimating~~ Using the recommended 1,210 yard safety and security zone surrounding the stationary tower structure/FSRU at 1,000 yards, an order-of-magnitude estimate of the number of potentially displaced lobster pots and lobstermen and an estimate of the overall direct and indirect economic impact on the lobster industry can be made. As discussed below, the projected economic losses associated with the Project are not significant in terms of the overall industry production, and any adverse economic impacts can be easily offset by Broadwater.

The trawling lane that parallels the New York and Connecticut border (*see* Figure 1-5) may be impacted by the FSRU and the associated safety and security zone. However, as shown on Figure 1-5, the established trawling lane is wide enough to accommodate trawling to the north. Section 3.1.2.3.1 of the Waterways Suitability Report states that ‘very few commercial trawl vessels utilize these lanes; generally, fishing occurs in summer during the month of August’.

### Economic Impacts of Lobster Fishing

Future annual landings for the safety and security zone were estimated. Detailed procedures and methodologies employed for this study which address value of average landings and density of lobster pots in Long Island Sound are provided in Appendix F. Based on recent average lobster pounds caught per pot in the Project ocean area (*see* Figure 1-6) and a potential range of potential lobster pots per trawl in Long Island Sound, the analysis indicates a restricted access area of ~~1,000~~ 1,210 yards from the FSRU radius would, for example, correspond to annual lobster landings valued at between \$5,000~~8,000~~ and \$20,000~~32,000~~ per year depending on the number of pots attached to a trawl. In other words, at 15 pots per trawl, the annual value of landings contained within a ~~1,000~~ the recommended 1,210 yard safety and security zone would average \$15,000~~24,000~~ (*see* Table E-6).

**Table E-6 Direct Economic Impacts-Summary Analysis  
Based on Range of Lobster Pots per Trawl**

Pots per Trawl	Economic Impact
<b>Value of Average Annual Landings (2010-2040)</b>	
5	\$5,029 <u>8,042</u>
10	\$10,059 <u>16,084</u>
15	\$15,088 <u>24,126</u>
20	\$20,118 <u>32,168</u>
<b>Cumulative Present Value of Future Annual Landings (2010-2040)</b>	
5	\$81,442 <u>130,224</u>
10	\$162,883 <u>260,447</u>
15	\$244,325 <u>390,671</u>
20	\$325,766 <u>520,894</u>

Also, as illustrated by Table E-6, the estimated cumulative present value of future landings is estimated to be ~~\$326,000~~ **approximately \$521,000** over the life of the Project. This represents a potential worse case economic loss scenario over the lifetime of the Project.

In addition to direct impacts, indirect and induced impacts were estimated. Direct economic loss has an indirect economic impact or stimulus on the suppliers and firms that are the recipients of subsequent rounds of spending related to the impacted activity. In addition, employees and households that earn wages from these industries are also impacted and they in turn spend a portion of their incomes in NYS. These latter impacts are called induced effects. The direct, indirect and induced impacts are summed and are called total economic impacts. The indirect and induced impacts represent the multiplier or ripple effects that are generated from the initial direct impacts on the lobster landings revenues.

The total economic impacts associated with the potential loss of lobster revenues due to a ~~1,000~~ **the recommended 1,210** yard safety and security zone were estimated for an average year, and also over the long-term 30 year operational life of the Project (*see* Table E-7). The long-term impacts were estimated for each year over the life of the Project and also expressed as a cumulative present value sum. The cumulative present value sum is a measure of



the total long-term impact in present worth terms. Table E-7 also presents the impacts to employee compensation, total value added and employment. With a ~~projected 1,000~~the recommended 1,210 yard safety and security zone for the Project, the total cumulative economic impact to the lobster fishing industry is estimated at approximately \$381,000649,000 in present values terms over a 30-year period. This represents the potential worst case scenario.

**Table E-7 Summary of Economic Impacts to NYS Associated with Ocean Area Size Equivalent to the FSRU Safety and Security Zone-Average Year and Long-Term Cumulative Impacts**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
<b>Total Industry Output</b>		
Direct	\$15,088 <u>24,126</u>	\$190,817 <u>324,96</u> 9
Indirect	\$5,837 <u>9,333</u>	\$73,819 <u>125,717</u>
Induced	\$9,197 <u>14,706</u>	\$116,315 <u>198,08</u> 9
Total	\$30,122 <u>48,166</u>	\$380,951 <u>648,77</u> 5
<b>Employee Compensation</b>		
Direct	\$3,493 <u>5,585</u>	\$44,175 <u>75,231</u>
Indirect	\$2,018 <u>3,227</u>	\$25,519 <u>43,460</u>
Induced	\$2,920 <u>4,669</u>	\$36,930 <u>62,894</u>
Total	\$8,431 <u>13,481</u>	\$106,624 <u>181,58</u> 5
<b>Total Value Added</b>		
Direct	\$9,389 <u>15,013</u>	\$118,742 <u>202,22</u> 2
Indirect	\$3,368 <u>5,386</u>	\$42,599 <u>72,547</u>
Induced	\$5,923 <u>9,471</u>	\$74,907 <u>127,570</u>

**Table E-7 Summary of Economic Impacts to NYS Associated with Ocean Area Size Equivalent to the FSRU Safety and Security Zone-Average Year and Long-Term Cumulative Impacts**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
Total	\$18,680 <u>29,870</u>	\$236,248 <u>402,340</u>
<b>Employment</b>		
Direct	0.8 <u>1.3</u>	<u>2540</u>
Indirect	0.00 <u>.1</u>	<u>12</u>
Induced	0.1	<u>24</u>
Total	1.0 <u>1.5</u>	<u>2946</u>

### Commercial Finfishing

The following section provides an evaluation and estimate of the value of commercial fishery landings that would potentially be forgone because of fishing grounds not being accessible over the proposed Project's 30-year lifetime due to establishment of a safety and security zone around the FSRU. Methods, assumptions, and procedures are also summarized. The comprehensive economic impact analysis evaluating overall impacts on commercial fisheries, recreation and tourism, and vessel traffic is attached as Appendix F.

The future annual value of commercial fish landings (2010 to 2040) are defined as the direct economic impact. The impact estimates are presented for an average year and for a period spanning the life of the Project.

The method used to estimate the value of commercial fisheries landings was based on using an extract of the commercial species landings data within the East End and West End of Long Island Sound provided in the Fisherman's Outreach report (*see* Figure 1-6). The annual value of landings corresponding to the species within the circular areas was projected forward over the 30-year life of the Project to arrive at an estimate of long-term impacts. No assumptions were made concerning species population growth or catch effort over this time period. The direct

economic impacts and value of commercial fish landings represent order-of-magnitude estimates using available information.

The data for commercial landings within the wide ocean area was scaled to estimate landings attributable to the ~~potential 1,000~~**recommended 1,210** yard safety and security zone ocean area (*see* Table E-8). Data was assembled on the total acreage corresponding to the ocean area between the East End and West End lines as displayed in Figure 1-6. The Project safety and security zone (in acres) was compared to the total acreage of the trawl areas. Table E-8 presents the results of these comparisons, while Figure 1-5 identifies the trawling areas.

The data in Table E-8 was used to scale the total landings data for the larger ocean area based on the acreage of the **recommended** safety and security zone. The direct economic impact estimates assume that similar types of species would be landed at depths corresponding to the ocean areas of the ~~proposed~~**recommended** FSRU safety and security zone location.

**Table E-8 Comparison of Long Island Sound Trawl Areas and Project Fishing Areas**

Trawl Areas	Acres	Square Miles
A	16,734.26	26.15
B	2,582.32	4.04
C	2,209.21	3.45
<b>Total</b>	<b>21,525.79</b>	<b>33.64</b>

Safety and Security Zone	Acres <u>in Trawl Area</u>	Percent of Total Trawl Area
<del>1,000</del> <b><u>1,210</u></b> yards	<del>248.34</del> <b><u>413.42</u></b>	<del>1.21</del> <b><u>1.9</u></b> %

Table E-8 shows the results of applying the scaling factors. Then Table E-9 shows the results of scaling the East End to West End Ocean Area by the acres corresponding to the Project's projected safety and security zone.



**Table E-9 Species, Total Live Pounds, and Estimated Value of Fish Harvested in Long Island Sound Commercial Fisheries During the 2002 and 2003 Fishing Seasons as Provided by NOAA and Estimated Values**

Long Island Sound East to West End Ocean Area <sup>a</sup>				Anticipated Landings in Pounds	Recommended Safety and Security Zone Ocean Area Surrounding Project FSRU Estimated Value of Landings
No.	Species	Pounds	Value		
1	Angler	43,680	\$34,462	<del>503.9</del> <u>838.91</u>	<del>\$354.50</del> <u>\$661.87</u>
2	Scup	40,733	\$29,200	<del>469.9</del> <u>782.31</u>	<del>\$377.80</del> <u>\$560.81</u>
3	Bluefish	14,827	\$5,130	<del>171.1</del> <u>284.76</u>	<del>\$51.20</del> <u>\$98.53</u>
4	Flounder, Summer	12,513	\$24,744	<del>144.4</del> <u>240.32</u>	<del>\$291.80</del> <u>\$475.22</u>
5	Tautog	3,642	\$6,117	<del>42.0</del> <u>69.95</u>	<del>\$85.20</del> <u>\$117.48</u>
6	Butterfish	3,527	\$2,138	<del>40.7</del> <u>67.74</u>	<del>\$25.50</del> <u>\$41.07</u>
7	Squid (Loligo)	1,810	\$1,358	<del>20.9</del> <u>34.76</u>	<del>\$16.90</del> <u>\$26.08</u>
8	Skates	1,767	\$251	<del>20.4</del> <u>33.94</u>	<del>\$2.80</del> <u>\$4.82</u>
9	Sea Robbins	1,222	\$202	<del>14.1</del> <u>23.47</u>	<del>\$1.80</del> <u>\$3.89</u>
10	Sea Bass, Black	1,093	\$2,609	<del>12.6</del> <u>20.99</u>	<del>\$30.00</del> <u>\$50.11</u>
11	Flounder, Yellowtail	770	\$846	<del>8.9</del> <u>14.79</u>	<del>\$11.80</del> <u>\$16.25</u>
12	Flounder, Winter	572	\$648	<del>6.6</del> <u>10.99</u>	<del>\$8.20</del> <u>\$12.44</u>
13	Bass, Striped	272	\$681	<del>3.1</del> <u>5.22</u>	<del>\$7.40</del> <u>\$13.08</u>
14	Dogfish, Smooth	189	\$58	<del>2.2</del> <u>3.63</u>	<del>\$0.60</del> <u>\$1.12</u>
15	Hake, Red	92	\$37	<del>1.1</del> <u>1.77</u>	<del>\$0.50</del> <u>\$0.70</u>
16	Croaker, Atlantic	26	\$13	<del>0.3</del> <u>1.05</u>	<del>\$0.20</del> <u>\$0.25</u>
17	Eel, Conger	25	\$14	<del>0.3</del> <u>0.48</u>	<del>\$0.10</del> <u>\$0.27</u>
18	Bonito	12	\$18	<del>0.1</del> <u>0.23</u>	<del>\$0.10</del> <u>\$0.35</u>
19	Flounder, Sand-Dab	4	NA	<del>0.0</del> <u>0.08</u>	<del>NA</del> <u>na</u>
	<b>Total:</b>	<b>126,776</b>	<b>\$108,527</b>	<b><del>1,463</del> <u>2,434.83</u></b>	<b><del>\$1,267.20</del> <u>\$1,084.34</u></b>

Table E-9 shows the results of the scaling calculations using the relative number of trawl area acres to estimate the value of fish landings. The table shows that, by applying this



method, the recommended FSRU safety and security zone area would correspond to several thousand dollars worth of fish landings within an average year.

The annual value of dockside landings was used to project the total economic impacts corresponding to this ocean area as shown below. Table E-10 shows the estimated direct economic impact. Since the impacts are expected to occur in future years, the annual and cumulative value of landings are expressed in present value terms using a 5% discount rate to acknowledge the time value of money.

**Table E-10 Summary of Economic Impacts to NYS Commercial Fisheries Average Year and Long-Term Cumulative Impacts with 1,000 Recommended 1,210 Yard—Projected U.S. Coast Guard Safety and Security Zone**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
<b>Total Industry Output</b>		
Direct	\$1,328 <u>2,211</u>	\$21,510 <u>35,809</u>
Indirect	\$514 <u>855</u>	\$8,321 <u>13,853</u>
Induced	\$810 <u>1,348</u>	\$13,112 <u>21,828</u>
Total	\$2,652 <u>4,415</u>	\$42,943 <u>71,489</u>
<b>Employee Compensation</b>		
Direct	\$308 <u>512</u>	\$4,980 <u>8,290</u>
Indirect	\$178 <u>296</u>	\$2,877 <u>4,789</u>
Induced	\$257 <u>428</u>	\$4,163 <u>6,930</u>
Total	\$742 <u>1,236</u>	\$12,019 <u>20,009</u>
<b>Total Value Added</b>		
Direct	\$827 <u>1,376</u>	\$13,385 <u>22,283</u>
Indirect	\$297 <u>494</u>	\$4,802 <u>7,994</u>
Induced	\$521 <u>868</u>	\$8,444 <u>14,057</u>
Total	\$1,645 <u>2,738</u>	\$26,632 <u>44,334</u>

The estimated commercial landings in pounds were held constant over the projection period but the annual unit value (\$/lb) used to calculate the annual value of landings was increased over time based on the historic trend growth rate for all combined species. The long-term, or cumulative, total impact over the 30-year life of the Project would be

approximately \$42,000~~71,000~~ in present value terms with the ~~4,000~~recommended 1,210 yard safety and security zone.

### **Potential Habitat Sanctuary Impacts**

It is possible that the loss of fishing access to the safety and security zone area may enhance select populations of commercially valuable species by functioning as a de facto haven where fishermen are precluded from entering and placing stress on these populations. The restricted access may potentially lead to a rebound in overstressed species by allowing select populations at formative lifecycle stages to recover unimpeded by the threat of fishing gear and boats. This potential impact has not been quantified or estimated, but it should be considered as a form of de facto mitigation over the life of the Project.

#### **1.1.4 Dumping Grounds**

Several active and inactive dumping grounds are located in Long Island Sound. The active dumping grounds include the Central Long Island Sound Disposal Site, the Cornfield Shoals Disposal Site, and the Western Long Island Sound Disposal Site. All of these sites are located in Connecticut waters. No portion of the proposed Project is located within, or in the vicinity of, these disposal sites (*see* Figure 1-1).

Inactive or historic disposal sites include the Southport Historic Disposal Site, the Bridgeport Historic Disposal Site, the Smithtown Historic Disposal Site, and the Port Jefferson Historic Disposal Site. The Port Jefferson Disposal Site, which is located approximately 1 mile (1.6 km) south of the proposed pipeline route, is the disposal site closest to the Project area. The site may have been used for disposal of sediments from Port Jefferson Harbor or other local projects, and any use would have occurred prior to 1977 (Fredette 2005; Gregus 2005). The site is located in an area with an erosional/non-depositional sedimentary environment. Historic disposal sites were located in these areas to allow any dumped sediment to be dispersed by natural hydrology. Based on Broadwater's spring 2005 sampling effort, no evidence of elevated contamination was identified within the identified Port Jefferson Disposal Site. No other known historic disposal sites are located within the area affected by the proposed Project.

## **Potential Marine Use Compatibility Issues**

Based on the current Project alignment, no marine use impacts or conflicts on or from dump sites are anticipated.

### **1.1.5 Shipwrecks**

Based on information obtained from the NOAA Automated Wreck and Obstruction Information System, there appear to be several identified wrecks in the general Project area, the majority of which are in the vicinity of the Stratford Shoal Middle Ground Area. In March and April 2005, Broadwater conducted a preliminary survey that included bathymetry, side-scan sonar, and magnetometer studies to develop a route for the proposed pipeline.

## **Potential Marine Use Compatibility Issues**

No shipwrecks are located within the central construction corridor. Within the proposed anchor spread, a total of nine anomalies were identified that could potentially be significant cultural resources. During construction, safety and security zones will be established around each of these targets, and midline buoys will be used to avoid impacts on these targets. As such, no impacts on shipwrecks, or any potentially significant cultural features, are expected. Resource Report No. 4, Cultural Resources, incorporated by reference herein, provides complete details of the archaeological investigations completed for the Project (*see* Environmental Reports, Confidential and Privileged Volume, Volume VII).

### **1.1.6 Lightering Zones**

Lightering zones are designated locations for anchoring and ship-to-ship transfer operations. Several lightering zones are located in Long Island Sound (*see* Figure 1-1). These lightering zones were identified by reviewing current NOAA navigation charts for the Sound.

The lightering zones closest to the proposed FSRU location include one located south of East Haven, Connecticut, in Connecticut waters, and one located north of Riverhead, New York, in New York waters. The lightering zone south of East Haven, which is closest to the FSRU, is more than 2.5 miles (4 km) from the proposed facility location.

The lightering zones closest to the proposed pipeline include one located north of Port Jefferson, New York, in New York waters, a zone north of Fort Salonga, New York, in New

York waters, and a zone located south of Bridgeport, Connecticut, in Connecticut waters (*see* Figure 1-1). The zone north of Port Jefferson, which is closest to the proposed pipeline route, is approximately 0.5 mile (0.8 km) from the proposed facility location.

### **Potential Marine Use Compatibility Issues**

No direct impacts or conflicts with any of these areas are expected. Indirect impacts may include temporary rerouting of vessel traffic into these areas during construction activities. All appropriate notifications will be made and standard marine practices and precautions will be followed so as to not interfere with anchoring or lightering activities.

#### **1.1.7 Vessel Traffic**

Vessel traffic in Long Island Sound includes commercial shipping, recreational boating, ferry services, and sightseeing tours. Each aspect of vessel traffic in the Sound is discussed below. A discussion of the anticipated increase in vessel traffic from the proposed Project, anticipated change in type of vessel traffic that will transit the Sound, and potential vessel traffic conflicts is provided below.

### **Commercial Shipping**

Information on commercial vessel traffic from the United States Army Corps of Engineers (USACE) was gathered and analyzed in consultation with the U.S. Coast Guard Vessel Traffic Service New York, the New York Pilots Association, and USACE. Domestic and foreign traffic were addressed, but fishing vessels and escort tugs were not included. Each of the deepwater ports receives transit tankers that are similar in size to LNG carriers.

Commercial shipping in the Project area mainly involves vessels arriving and departing the ports of Northport, Northville, and Asharoken, New York, and Bridgeport and New Haven, Connecticut. Based on USACE data, the Connecticut ports receive significantly more traffic than the New York ports. Bridgeport is the most active commercial port in the Sound, with over 10,000 vessels per year. New London registers over 5,000 vessels per year, and New Haven approaches 2,000 vessels per year. Typical cargo for these ports includes oil, other petroleum products, bulk chemicals, and containerized goods. While the vast majority of the vessels calling on these ports will be significantly smaller than the LNG carriers, ~~it is estimated~~

~~that up to 300 vessels per year within the Sound would be similar in appearance and size to the LNG carriers that will service the FSRU. It is also estimated that up to three to four vessels per month accessing the New York ports would be similar in appearance and size to the LNG carriers that will service the FSRU.~~ the Waterways Suitability Report identifies 69 US flagged vessels and 939 foreign commercial vessels 500 feet or greater in length arrived in Long Island Sound between 2003 and 2005. Of these vessels 306 are greater than 700 feet in length (Waterways Suitability Report Table 2-5). Additional vessel traffic in the Sound is associated with vessels calling on ports of New York and New Jersey. While the vast majority of ships servicing ports in New York and New Jersey leave New York Harbor via southern channels, it is estimated that one to two ships per month utilize Long Island Sound.

As mentioned previously, in the absence of a traffic routing scheme in Long Island Sound, federal navigational aids and standard marine practices have led to the development of established traffic patterns and generalized shipping routes in the Sound. The main shipping route runs generally down the center of the Sound on a straight course from deepwater areas in the eastern Sound to the deepwater pass through Stratford Shoal, with a secondary shipping route trending from northeast to southwest toward Northport, New York. Traffic branches off to enter deepwater ports (*see* Figure 1-3). Broadwater located the proposed FSRU outside of this traffic pattern specifically to avoid and minimize impacts on commercial shipping.

Table E-11 presents 2003 commercial vessel traffic counts for deepwater ports in Long Island Sound as provided by USACE. Ports and traffic routes are depicted on Figure 1-3.

**Table E-11 Commercial Vessel Traffic in Long Island Sound (2003)**

Deepwater Ports <sup>1</sup>	Vessel Trips per Year	Transit Tankers
Bridgeport, CT	21,588	27
New London, CT	10,564	10
New Haven, CT	3,603	469
Port Jefferson, NY <sup>2</sup>	21,943	—
Northville, NY	1,207	31
Asharoken, NY	282	11
New York, NY <sup>3</sup>	50	50
Northport, NY	24	Unknown

Source: USACE 2005.

<sup>1</sup> Foreign and domestic traffic were totaled for deepwater ports; fishing vessels and escort tugs were not included.

<sup>2</sup> Vessel traffic received at Port Jefferson is significant; however, vessels range in size from less than 500 gross registered tons (GRT) to 25,000 GRT. Two transit tankers were noted in the overall traffic numbers that are likely similar in appearance to an LNG carrier. However, they are much smaller in size.

<sup>3</sup> While 21,789 vessels were reported for New York Harbor, the majority of these vessels do not approach through Long Island Sound due to strong currents.

In May 2005, a PAWSA was conducted for Long Island Sound in which the U.S. Coast Guard provided vessel arrival data for the significant harbors in Long Island Sound. The PAWSA was conducted to understand and address issues associated with waterway risks and potential intervention actions to avoid waterway risks, including the Broadwater Project. The process involved gathering together a select group of waterway users and stakeholders to evaluate waterway risk factors in Long Island Sound and the effectiveness of various intervention factors.

The PAWSA-generated data differed from the USACE-derived data in that only vessels required to provide a Notice of Arrival under the Vessel Traffic Service were included, making this a subset of the total vessel traffic.

### **Ferry Routes**

Several ferry services operate year-round in Long Island Sound and Block Island Sound, and coordination between the Project and potentially affected ferry operators began

during the U.S. Coast Guard's PAWSA Workshop. Broadwater has been actively engaged with ferry operators throughout this Project.

Installation of the subsea pipeline may have some minor, temporary impact on the Port Jefferson-to-Bridgeport ferry service. Due to the linear nature of the Project, the installation activity and associated construction barges, boats, and tenders will move along the route and not stay in one area for long. During construction operations, Broadwater will closely coordinate schedules with the ferry operator to provide for minimal disruption to the ferry schedule. Once the pipeline has been installed, no impact would occur as a result of operation of the pipeline.

### **Other Vessel Traffic**

The Naval Submarine Base New London is located in Groton, Connecticut (*see* Figure 1-2), and most of the naval vessels operating from New London are submarines. For security purposes, the exact routes of naval submarines are not published and are, therefore, not shown on the figure. Although impacts on naval vessels are not expected, coordination and communication between the Navy and LNG carriers will be required to ensure that scheduling requirements are enforced and there are no safety concerns with these vessels as they transit this area. In addition, the U.S. Coast Guard is charged with providing security zones around submarines as they travel through the Sound. The U.S. Coast Guard would have the same responsibility for safeguarding LNG tankers. As a result, coordination of the tanker and submarine traffic should not be a problem, according to the captain of the port for Long Island Sound, Captain Peter Boynton. *See* "CG Captain Sees Subs, Tankers Co-existing; Security zones for LNG vessels in L.I. Sound viewed as routine," Paul Choiniere, *The Day*, 3/16/06.

### **Potential Marine Use Compatibility Issues**

#### **Potential Conflicts with Commercial/Recreational Vessels in the Race.**

The greatest potential for marine conflict would arise from the operation of the FSRU and the ingress and egress of LNG carriers, particularly in the area of the Race, ~~which constricts traffic flow between the Atlantic Ocean and Long~~ the eastern entrance to Long Island Sound and a critical waterway connecting Long Island Sound to Block Island Sound (*see* Figure 1-7). ~~Passing vessels merge into a corridor that is about 3 nm long and 3 nm wide.~~

Vessels using the Race include a broad mix of naval vessels with traveling security zones, commercial deep-draft vessels, commercial fishing vessels, and recreational fishing and pleasure crafts. Even with the real restrictions imposed, the Race does currently not have a Traffic Separation Schedule (TSS). During high traffic periods, mainly summer and holidays, the Race can be relatively congested.

Navy vessel data is not tracked in U.S. Coast Guard's PAWSA database, but these vessels likely consist primarily of submarines. Broadwater will continue to coordinate with the Navy regarding the coordination of vessel passage, but based on the infrequency of LNG carriers, this issue can be readily managed, as described in the Waterways Suitability Report at § 4.6.1.2.

As mentioned, commercial vessels will have pilots on board, which allows for close coordination of incoming and outgoing commercial vessels. Given that the Race currently constricts passage of larger commercial vessels, continued coordination between the pilots will ensure that conflicts are appropriately managed. An LNG carrier and a commercial vessel would not be able to simultaneously pass through the Race due to the narrow passage and ~~likely~~ **recommended** safety and security zone requirements. If an LNG carrier and a commercial vessel arrive at the Race at the same time, one vessel will need to wait while the other passes through. Broadwater has estimated that it would take approximately 15 minutes to pass through the Race, resulting in no significant delay for other commercial vessels. Based on Broadwater's current proposal, only two to three carriers per week would call on the FSRU, minimizing conflict at the Race.

There is a significant amount of push or pull barge traffic in the Race area and this consists of the largest traffic density as identified in the PAWSA database. Since two commercial vessels cannot pass through the Race simultaneously, either the LNG carrier or the barge/tug would need to wait until the other has cleared the Race. This is consistent with the current procedures observed in the Race.

Most of these vessels transit through the Race during periods of little or no tidal currents. Due to strong tidal currents in the Race, most commercial and recreational fishing vessels likely cross the Race during slack tide. Therefore, Broadwater may be able to schedule



LNG carrier traffic through the Race outside of slack water periods and may also be able transit the Race during nighttime hours when there is less traffic present in the Race area. Once through the Race, the vast majority of commercial traffic heading toward Connecticut ports would not be impacted by LNG carrier transits, with the commercial traffic utilizing the northern of the two primary shipping routes and the LNG carriers using the southern route. Based on the PAWSA data, approximately 20% of the commercial traffic services either the New York ports or the offshore Northport Terminal/Riverhead Terminal. There is ample room within the eastern portion of the Sound for these vessels to pass at a safe distance.

Due to the overall size of Long Island Sound, there will be ample room for both LNG carriers and fishing or recreational vessels to avoid conflict. NYSDOS has raised concerns regarding potential impacts on existing lobster fishing (i.e., set trap lines) resulting from the transit of the LNG carriers. However, the LNG carriers will be routed along an existing, recognized shipping route that experiences regular commercial usage. Therefore, any conflict resulting from increased vessel traffic due to the presence of the carriers will be a conflict that the lobstermen already experience.

### **LNG Carrier Routing**

An analysis of the proposed LNG carrier routes was conducted to evaluate potential marine conflicts in the area of the Race and along the LNG carrier routes entering into Block Island Sound and Long Island Sound from the Atlantic Ocean. The analysis covers shorelines and relevant offshore features from Point Judith, Rhode Island, and Montauk, New York, to the entrance into Long Island Sound at the Race and onwards to the proposed FSRU location. This includes an analysis of the shoreline features of Rhode Island, the far eastern shorelines of New York and Connecticut, and Block Island. The LNG carrier route and associated safety and security zone are indicated on Figure 1-2.

An LNG carrier will transit to the proposed FSRU on average once every two to three days. Based on preliminary routing, there are two routes that LNG carriers may take when entering Block Island Sound prior to entering Long Island Sound via the Race:

- The Northern Route, which runs between Block Island and Point Judith, Rhode Island; and

- The Southern Route, which enters Block Island Sound via the Montauk Channel.

For both routes, the LNG carriers would be nearest the shoreline as they enter Long Island Sound via the Race. As described in Section 3.2.5.3 of the Waterways Suitability Report, LNG carriers transiting the Race will pass within 1.4 miles of Fishers Island NY.

**The Northern Route.** The Northern Route is assumed to start at the U.S. territorial border south and east of Block Island and follow a north-northwesterly course to the pilot station located north of Block Island. At this location, the LNG carrier would be approximately 4.3 nm (5 statute miles) from Point Judith, Rhode Island. Along the remainder of the inbound transit from north of Block Island to the proposed FSRU location, the carrier would follow a route that is not less than 3.3 nm (3.8 statute miles) from the shoreline of Rhode Island, Connecticut, or New York.

The Northern Route is approximately 87 nm (100 statute miles) in length, and water depths exceed 100 feet (30.5 m) for the majority of the route.

**Southern Route.** Arriving LNG carriers would approach the Southern Route from a northerly course beginning at the U.S. territorial border (*see* Figure 1-2), on a heading toward the Montauk pilot station near waypoint S2. With the exception of the initial waypoints, the route is similar as described for the Northern Route. The length of this leg is approximately 78 nm (90 statute miles).

**Potential Conflicts with Vessels during Pipeline Installation.** No significant, permanent impacts on, or conflicts with, commercial shipping are expected to result from installation or operation of the subsea pipeline. Installation of the pipeline will be completed in an approximately 6-month time frame between October and April. Although the pipeline construction route will infringe temporarily on the shipping route approaching Bridgeport, Connecticut, due to the linear nature of the Project, the installation activity and associated construction barges, boats, and tenders will move along the route and not stay in one place for long. The offshore areas allow for movement of commercial vessels from one place to another; therefore, commercial shipping can continue in other areas as the Project installation moves

across the Sound. Constant communication between construction vessels and other commercial traffic will ensure that adequate safety margins are maintained.

There is an established performance history associated with constructing subsea utilities (i.e., natural gas pipelines, submarine electric transmission cables, and submarine fiber-optic cables) within Long Island Sound. All of these projects required effective communication between construction vessels and other commercial and recreational vessels within the Sound. In the past five years the following projects were successfully constructed: Eastchester Expansion Pipeline Project, the Cross Sound Cable, and the Flag Atlantic-1 North fiber-optic cable.

**Economic Impact on Vessel Traffic.** The Broadwater FSRU location and surrounding safety and security zone will be identified on marine navigational charts and illuminated at night, and the FSRU safety and security zone will be marked by buoys. The footprint of the FSRU and the recommended safety and security zone is not large enough to result in an economic impact based on the potential interruption or delay of transiting vessels. While some transiting vessels may need to navigate around this location, there is sufficient room within the established shipping ~~lanes~~routes to easily accommodate these changes without imposing additional operational costs on commercial vessel operators. Historically, commercial vessels and navigators have become familiar with noteworthy parts of Long Island Sound (e.g., Stratford Shoal and the Race) and have adjusted their operations accordingly without incurring any disruptions to economic activity.

Furthermore, as the Long Island Sound Waterborne Transportation Plan indicates, most waterborne freight consists of heavy bulk commodities that are not time sensitive or tied to just-in-time inventory schedules, as the freight mostly serves service sectors of the regional economy, and not manufacturing. This fact suggests that the possibility of any minor delays to shipping traffic resulting from FSRU operations would not have a negative economic impact on these sectors.

It is reasonable to expect that, once Broadwater operations commence, navigators would become familiar with the Project footprint and adjust their behavior to work with and around this site location. The east-to-west and west-to-east commercial freight traffic has adapted to north-to-south and south-to-north ferry transits without any interruptions to economic

activity. Similarly, the LNG vessel transits to and from the FSRU would be incorporated into existing commercial vessel flow patterns without incurring any impacts on economic activity.

Furthermore, the scheduling of LNG carrier arrivals will take into account the use of the area by other marine traffic and will require close cooperation between Broadwater, the U.S. Coast Guard, and other operators to ensure impacts on other users of the Sound are avoided or minimized.

#### **1.1.8 Recreation and Tourism**

Recreation and tourism are important segments of the economies of both Suffolk County and the Long Island, especially in the more rural eastern portion of the County and Long Island. In Suffolk County alone there are 986 miles of shoreline and over 70,000 acres of parkland, which makes it a valuable recreational resource. In addition, Suffolk County has 38,000 seasonal homes, which ranks it amongst the highest in that category in the country.

The major recreational uses of Long Island Sound include activities such as swimming, beach going, recreational/sportfishing, and recreational boating. Information and data were gathered on these recreational activities to determine annual economic impacts on the Long Island Sound community and to develop a determination of potential impacts resulting from the Project.

Individuals utilizing Long Island Sound for recreational purposes are either residents of the surrounding communities in New York and Connecticut or are tourists from outside of the area. Trends in tourist visitation to Long Island Sound were estimated based on data received on hotel stays from the Long Island Convention and Visitors Bureau and Sports Commission (LICVB). From 1999 to 2005, it was estimated that the number of hotel stays has remained essentially constant for Long Island (Nassau and Suffolk Counties). There was a slight drop in occupancy rates between these years; however, there was also an increase in over 2,000 rooms to the hotel/motel room inventory. Based solely on hotel stays, it was assumed that that tourist visitation to Long Island has remained essentially constant over the past five to six years, even though tourism as a whole over that period experienced a slowdown related to national security events.

**Recreational Spending.** The quantification of recreational spending in the Long Island Sound area will be divided into beach swimming, recreational/sportfishing, and recreational boating due to data availability and distinction between activities.

In 1992, a study of the economic impact of these three above-defined recreational activities was conducted by Dr. Altobello of the University of Connecticut – *The Economic Importance of Long Island Sound's Water Quality Dependent Activities*. The results of the study are presented in Table E-12. The data contained in the table includes total user values, which represent the value of the resource to the actual users. Direct effects include actual spending on goods and services in the community related to recreational activities. The indirect effects represent impacts from direct recreational spending on industries throughout the region. Induced effects represent the spending impacts from affected households along the supply chain.

Since the study was conducted using 1990 dollars, the results have been inflated to 2005 dollars using the Consumer Price Index (CPI). This is the most commonly referenced study when addressing the economic impact of recreational activities in Long Island Sound and is the source of the commonly used figure of \$5.2 billion of economic impact. Using the CPI to update the 1990 impact estimate to current price levels, it was estimated that the economic impact from these recreational activities on Long Island Sound is now valued at \$7.1 billion. This procedure is used by the Bureau of Labor Statistics (BLS) for rough estimating purposes and is based on assuming similar participation levels among residents and tourists (BLS 2006).

The three major recreational activities are further defined and discussed in the sections below, and additional studies are used to outline the economic impacts and the potential effects of the Broadwater Project on this resource.

**Beach Swimming.** Beach visitation and beach swimming result in a variety of economic impacts on the local community through retail purchases, food and beverage purchases, accommodations, and miscellaneous trip expenses (e.g., gas, tolls, etc.). As presented in Table E-12, the total economic impact of beach swimming in Connecticut and New York was \$622.2 million and \$514.61 million respectively. This equates to a total impact of \$1,136.81 million for the Long Island Sound area in 2005 dollars. The only adjustment made to the final results of the study was an inflation adjustment to 2005 dollars based upon the CPI.

**Table E-12 Total Recreational Values for Long Island Sound, 1990 and 2005 dollars**

	Total User Values (million \$)		Direct Effects (million \$)		Multiplier Effects (Indirect + Induced) (million \$)		Total (million \$)	
	1990	2005	1990	2005	1990	2005	1990	2005
<b>Connecticut</b>								
Beach Swimming	\$99.83	\$134.66	\$159.10	\$214.60	\$202.35	\$272.94	\$461.28	\$622.20
Sportfishing	\$11.08	\$14.95	\$258.46	\$348.62	\$366.17	\$493.91	\$635.71	\$857.48
Boating	\$56.23	\$75.85	\$836.00	\$1,127.64	\$1,003.20	\$1,353.16	\$1,895.43	\$2,556.65
<b>Connecticut Totals</b>	<b>\$167.14</b>	<b>\$225.45</b>	<b>\$1,253.56</b>	<b>\$1,690.86</b>	<b>\$1,571.72</b>	<b>\$2,120.01</b>	<b>\$2,992.42</b>	<b>\$4,036.32</b>
<b>New York</b>								
Beach Swimming	\$82.57	\$111.37	\$131.59	\$177.49	\$167.36	\$225.74	\$381.52	\$514.61
Sportfishing	\$11.13	\$15.01	\$173.09	\$233.47	\$245.22	\$330.76	\$429.44	\$579.25
Boating	\$42.33	\$57.10	\$629.31	\$848.84	\$755.17	\$1,018.61	\$1,426.81	\$1,924.55
<b>New York Totals</b>	<b>\$136.03</b>	<b>\$183.48</b>	<b>\$933.99</b>	<b>\$1,259.81</b>	<b>\$1,167.75</b>	<b>\$1,575.12</b>	<b>\$2,237.77</b>	<b>\$3,018.41</b>
<b>CT and NY Totals</b>	<b>\$303.17</b>	<b>\$408.93</b>	<b>\$2,187.55</b>	<b>\$2,950.67</b>	<b>\$2,739.47</b>	<b>\$3,695.13</b>	<b>\$5,230.19</b>	<b>\$7,054.73</b>

Source: Altobello 1992 and BLS 2006.

## Recreational Boating

Long Island Sound is a popular recreational boating area. During construction of the proposed pipeline facilities, there will be a temporary and minor loss of recreational boating area in the immediate vicinity of the active work area. Because installation will occur primarily during the winter months, when use of the Sound by recreational boaters is reduced, impacts on recreational boating are minimized. The Waterways Suitability Report confirms that in general, the majority of recreational boating occurs within 3 miles of shore. Therefore, installation of the facilities is expected to have only minor, if any, impacts on recreational boating. During operation, the proposed pipeline will have no effect on recreational boating due to its installation beneath the seafloor.

By siting the facility centrally in the Sound, impacts are minimized, and the Project will not result in significant limitations on public access to the Sound. An assessment of the potential economic impacts on recreational boating is provided below.

**Economic Impact of Recreational Boating.** The Altobello study mentioned above looked at the economic impact of recreational spending on various activities, including boating, and estimated the economic impact of recreational boating on Long Island Sound (sum of direct, indirect, and induced effects plus the user value) in 1990 as \$3.322 billion, of which the New York State portion was \$1.427 billion. Inflated to current prices, that would translate to an overall impact of \$4.481 billion in total, and \$1.925 billion for New York State (Altobello 1992).

A more recent study on recreational boating was completed for New York State in 2003 under the New York Sea Grant – *Recreational Boating Expenditures in 2003 in New York State and Their Economic Impacts*. A benefit of this study is the breakdown by geographic region; however, since it is only a state-wide study, no economic impacts are noted for Connecticut. In addition, the 2003 New York Sea Grant study indicated a much lower overall economic impact from recreational boating than the 1992 Altobello study. It estimated that the total economic impact for the New York City Long Island Metropolitan Area was \$843 million in 2003 dollars (adjusted to 2005 dollars, this would equate to \$907 million). This is only half of the \$1.925 billion impact that was estimated in the 1992 study.



Table E-13 is a breakdown of trip expenditures by geographic area in downstate New York, which may be more representative of actual spending in Long Island Sound. The mean expenditure per boater, per trip in Long Island Sound was \$3,112 in 2003. Adjusted for inflation, this equates to \$3,346 in 2005 dollars.

**Table E-13 Trip-Related (and Non-Trip Marina) Expenditures by Category and Per Boater for Downstate New York Regions in 2003**

Expenditure Category	New York City Area	Long Island	Suffolk County	Long Island Sound
<b>At-site expenditures</b>				
Marinas and yacht clubs	\$16,714,906	\$41,213,188	\$33,417,610	\$19,961,521
Gas stations	\$6,047,504	\$21,520,880	\$15,064,446	\$7,733,943
Restaurants and bars	\$3,271,601	\$16,527,473	\$13,314,000	\$5,685,824
Grocery and convenience type stores	\$1,526,747	\$7,595,605	\$5,887,865	\$2,537,222
Bait and tackle shops	\$1,725,026	\$8,017,583	\$5,251,339	\$2,904,050
Boat launching and mooring fees	\$1,447,435	\$8,439,561	\$6,524,390	\$4,126,807
Lodging	\$575,099	\$1,898,901	\$1,909,578	\$1,467,309
Entertainment and all other expenses	\$2,756,076	\$2,602,198	\$2,386,972	\$1,161,620
All other retail purchases	\$396,558	\$4,430,769	\$3,766,112	\$1,772,999
Tournament fees	\$237,935	\$1,406,593	\$1,220,008	\$213,983
<b>At-site non-trip expenditures</b>				
Marinas and yacht clubs*	NA	NA	NA	\$43,928,160
<b>Total At-Site Expenditures</b>	<b>\$34,698,796</b>	<b>\$113,652,750</b>	<b>\$88,742,319</b>	<b>\$91,493,437</b>
<b>En Route Expenditures</b>	<b>\$5,650,947</b>	<b>\$7,806,594</b>	<b>\$5,622,645</b>	<b>\$3,637,704</b>
<b>Total Expenditures</b>	<b>\$40,349,743</b>	<b>\$121,459,343</b>	<b>\$94,364,964</b>	<b>\$95,131,141</b>
<b>Number of Boaters</b>	<b>19,828</b>	<b>70,330</b>	<b>53,044</b>	<b>30,569</b>
<b>Mean Expenditure per Boater</b>	<b>\$2,035</b>	<b>\$1,727</b>	<b>\$1,779</b>	<b>\$3,112</b>

Source: Connelly et al. 2004.

\* At-site, non-trip expenditures were only tracked for specific bodies of water and would include such expenditures as annual slip or mooring rental fee, haul-out, winterization, etc.



**Table E-13 Trip-Related (and Non-Trip Marina) Expenditures by Category and Per Boater for Downstate New York Regions in 2003**

Expenditure Category	New York City Area	Long Island	Suffolk County	Long Island Sound
<u>IMPLAN software was utilized in the 2003 New York State Sea Grant study to estimate the indirect and induced impacts of recreational boating. In Table E-14, the total output and total value added impacts are presented for Long Island Sound in both 2003 and adjusted 2005 dollars. Total output represents the value of industrial output or total sales in the regional economy. Value added represents the sum of employee compensation, proprietor income, other property income and indirect business taxes. Table E-14 Long Island Sound - Output and Total Value Added Impacts of Regional Boating Expenditures (trip plus marina non-trip-related) on Regions Surrounding Specific Water Bodies (2003 dollars)</u>				
<b>Output</b>				
<u>Long Island Sound (2003 dollars)</u>	<u>\$76,875,779</u>	<u>\$22,716,685</u>	<u>\$22,816,209</u>	<u>\$122,405,674</u>
<u>Long Island Sound (2005 dollars)</u>	<u>\$82,666,725</u>	<u>\$24,427,901</u>	<u>\$24,534,922</u>	<u>\$131,626,324</u>
<b>Total Value Added</b>				
<u>Long Island Sound (2003 dollars)</u>	<u>\$46,263,142</u>	<u>\$15,114,438</u>	<u>\$14,377,713</u>	<u>\$74,755,295</u>
<u>Long Island Sound (2005 dollars)</u>	<u>\$49,748,080</u>	<u>\$16,252,988</u>	<u>\$15,460,766</u>	<u>\$80,386,508</u>

Source: Connelly et al. 2004.

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**Table E-14 Long Island Sound Output and Total Value Added Impacts of Regional Boating Expenditures (trip plus marina non-trip-related) on Regions Surrounding Specific Water Bodies (2003 dollars)**

<b>Output</b>				
Long Island Sound (2003 dollars)	\$76,875,779	\$22,716,685	\$22,816,209	\$122,405,674
Long Island Sound (2005 dollars)	\$82,666,725	\$24,427,901	\$24,534,922	\$131,626,324
<b>Total Value Added</b>				
Long Island Sound (2003 dollars)	\$46,263,142	\$15,114,438	\$14,377,713	\$74,755,295
Long Island Sound (2005 dollars)	\$49,748,080	\$16,252,988	\$15,460,766	\$80,386,508

Source: Connelly et al. 2004.

Despite the difference in the overall total economic impact of recreational boating estimated by the two studies presented, it is apparent that this recreational activity results in major spending locally on boating trips, for supplies, equipment, food, services, and maintenance.

### **Recreational/Sportfishing**

Charter boat companies and private individuals use Long Island Sound as a recreational fishing area. Important recreational fisheries include flounder, bluefish, scup (porgies), striped bass, tautog (blackfish), and weakfish. Broadwater undertook a fishermen's outreach program for the proposed Project in order to identify interested parties that utilize the Sound for commercial and recreational fishing and to identify those that may be impacted by the Project. Information obtained from commercial and recreational fishermen through a telephone survey included: areas fished in Long Island Sound, targeted species, gear type, seasons fished, and concerns related to the proposed Project. The outreach program also included a review of available information related to catch.

The Marine Recreational Fishery Statistics Survey (MRFSS) indicated that an estimated 464,997 marine anglers made 1,537,899 trips in 2003 (CTDEP 2004). The three principal modes of recreational marine fishing included: fishing from shore (40%), fishing from privately owned or rental boats (56%), and fishing from party and charter boats (4%). Scup was

the most frequently creeled fish, followed by bluefish, summer flounder, tautog, and striped bass. These five species comprised approximately 94% of the total creeled catch.

The MRFSS was developed to provide government agencies, scientists, and the public with reliable estimates of the recreational fishery harvest as far back as 1979. The NOAA Fisheries database was queried for 2003 recreational landings in inland waters of Connecticut and New York, which are defined as “inshore saltwater and brackish water bodies such as bays, estuaries, sounds, etc.”

According to the MRFSS, recreational landings from New York and Connecticut exceeded 15 million pounds (6.8 million kg) during 2003. Bluefish, scup (porgies), striped bass, and summer flounder account for the vast majority of the landings in both states. While the top species harvested in Connecticut according to NOAA Fisheries are consistent with those reported by CTDEP (2004), the total landings are more than twice those reported by CTDEP (2004). One possible reason for this discrepancy is that while CTDEP (2004) relies on only an intercept survey to estimate total landings, NOAA Fisheries relies on that same intercept survey as well as a telephone survey.

**Economic Impact of Sportfishing.** The two sources used to determine the economic impact of sportfishing in Long Island Sound were the 1992 study from the University of Connecticut and a 2001 New York State Sea Grant report – *The Economic Contribution of the Sport Fishing, Commercial Fishing, and Seafood Industries to New York State*. Together these form the framework for assessing the economic impact of sportfishing.

According to the Altobello study (*see* Table E-12), the specific annual economic impact of sportfishing, inflated to 2005 dollars, in Long Island Sound on New York and Connecticut was \$579.25 and \$857.48 million, respectively, for a total of \$1,436.73 million. The benefit of this study is the examination of impacts on both Connecticut and New York State; however, it fails to look at trends and specific spending characteristics of marine anglers (Altobello 1992).

The following tables from the 2001 New York State Sea Grant study present more detailed information on marine (saltwater) fishing characteristics and trends in New York State.



Table E-15 presents two years of data on marine angler participation. After a peak in 1994, the total number of anglers has declined annually (Techlaw 2001).

**Table E-15 New York State Marine Anglers, 1996 and 1998**

Number of Anglers	Activity in New York State					
	Total		New York Residents		Non-Residents	
	Number	Percent	Number	Percent	Number	Percent
1996	539,540	100	501,130	92.9	38,410	7.1
1998	475,720	100	433,226	91.1	42,494	8.9

Source: Techlaw 2001.

An important indicator of sportfishing expenditures is the mode by which the angler is able to fish. Many individuals fish from shore, while others own boats, rent boats, fish from party boats, or charter boats from fishing guides. Table E-16 presents the total number of trips and mode by fishing area. It should be noted that Long Island Sound is considered an inland water body with respect to this study (*see* note in Table E-16). The most popular type of fishing area is inland waterway (which includes Long Island Sound), and the most popular mode of fishing for each fishing area is from a privately owned or rented boat.

**Table E-16 New York State - Numbers of Trips by Mode and Fishing Area, 1998**

Mode	Inland <sup>1</sup>	Percent	Ocean ≤3 miles		Ocean >3 miles		Total
			Percent		Percent		
Shore	1,043,064	36.0	131,686	30.5	NA	0	1,174,750
Party/Charter <sup>2</sup>	163,394	5.7	106,071	24.6	25,431	16.3	294,896
Private/Rental	1,687,595	58.3	194,141	44.9	130,342	83.7	2,012,078
Total	2,894,053	100	431,898	100	155,773	100	3,481,724

Source: Techlaw 2001.

Notes: NA = not applicable.

<sup>1</sup> Other bodies of saltwater besides the ocean; sounds, inlets, tidal portions of rivers, bays, and estuaries.

<sup>2</sup> Party boats conduct daily, scheduled trips and provide anglers with the ability to go fishing without advanced planning. There is a fee that covers their fishing needs. Party boat vessels carry 30 or more passengers. Charter boats carry passengers who have pre-arranged fishing trips for certain species. Fees are based on species to be fished and distance. Charter boats carry six to eight passengers, although some carry more.

Specific data that summarizes employment in the fishing industry has not been collected. However, sportfishing employment can be estimated by using U.S. Census sales per

employee data for the services and retail businesses that make up the sportfishing industry. Using this method, it is estimated that the employment impact in the sportfishing industry is over 17,000 jobs. These jobs are a mix of full- and part-time positions (Techlaw 2001).

### **Boating Surveys**

To supplement and expand on literature research and interviews with local resources, Broadwater performed a boat traffic survey in the summer of 2005 to observe commercial and recreational boat traffic patterns in the vicinity of the proposed Project (*see* Appendix B). Based on the results of the survey, Broadwater assessed the potential impacts resulting from construction and operation of the FSRU and pipeline on commercial and recreational boating activities in Long Island Sound.

The objective of the boat survey was to quantify boat use in the area of the proposed Project during holiday weekends and other high-use days during the summer to observe the maximum boat traffic near the proposed FSRU location and along the proposed pipeline route. High-use days included days where sailing regattas and excellent weather coincided, which often overlapped with holiday weekends. For major findings of the boat traffic survey, refer to the separate report entitled Boat Traffic Survey (*see* Appendix I).

### **Potential Marine Use Compatibility Issues**

**Potential Economic Impact from the Broadwater Project.** When examined based upon the three major recreational activities outlined in this section, the potential economic impact from the Broadwater Project has varying results due to the nature of activity. Swimming and beach visitation are not expected to be impacted as a result of the Broadwater Project due to the inherent distance of these activities from the proposed FSRU location. However, boating and fishing activities could take place closer to the FSRU and the surrounding safety and security zone during Project operations and, thus, could be negatively impacted. These recreational activities and estimated impacts are discussed individually below.

**Beach Swimming.** Beach visitation and swimming are activities confined, by definition, to coastal areas with beaches. The closest coastline to the proposed location of the Broadwater Project is 9 miles away and does not inhibit or alter the ability of residents or tourists

from participating in beach-going activities or swimming. As a result, it is estimated that the Broadwater Project will have no impact on this recreational activity or its associated economic impact on the Long Island Sound area. Observations from other coastal communities around the U.S. show that beach attendance has not been affected in any material way by compatible industrial and commercial marine activities. For instance, beach users in South Florida are accustomed to seeing large cargo and freight vessels transit the coastline within their activity viewsheds. These economic activities have not detracted from the recreational experience or beach attendance, as revealed in hotel occupancy data figures.

There may be some perceived adverse impact associated with the view, depending on weather, of the FSRU in the Sound when either swimming or at a beach. However, this potential impact is discussed in Resource Report No. 8, Land Use, Recreation, and Aesthetics, which is incorporated by reference herein, and is not assumed to have a negative economic impact with respect to this recreational activity.

**Recreational Boating.** As discussed previously, recreational boating on Long Island Sound is a significant economic driver and results in several billion dollars in total economic impact annually. The Boat Traffic Survey conducted as part of Resource Report No. 8, Land Use, Recreation, and Aesthetics, outlines the approximate boating activity in the vicinity of the Project site during several of the busiest boating days of the year. Beyond short-term impacts associated with construction-related activities, there are expected to be no impacts associated with the proposed pipeline since it is on the seafloor.

Data from the Boat Traffic Survey was used to analyze the economic impact on recreational boating. The survey found that 2.1 boats per survey hour came within 0.6 mile of the proposed FSRU location. According to the 2001 New York State Sea Grant study, the mean expenditure per boater was \$3,346 in 2005 dollars. Since the Boat Traffic Survey was performed during the busiest boating days of the year, it is assumed that one boat per hour is an appropriate figure, using 10-hour days and a 6-month (May to October) recreational boating season. This equates to 1,840 total boats (1 boat per hour x 10 hours of boating time per day x 6 months of boating season) that would approach the proposed FSRU annually. When the average expenditure per boater is applied to this boating estimate, a total direct economic impact of

\$6,156,640 is obtained. When measured against a total expenditure for Long Island Sound of \$102,297,238 (according to Table 4-4, inflated to 2005 dollars), the potential loss in expenditures equals 6%. However, this assumes that all boaters on a course that would take them in the vicinity of the proposed FSRU would not boat and would expend absolutely no money on boating activities, whereas the far more likely scenario is that they would choose to avoid the area of the proposed FRSU through prior trip planning or small course adjustments, and the overall economic impact would be minimal.

**Impact of ~~Proposed~~Recommended Safety and Security Zone.** The ~~projected~~recommended safety and security zone sensitivity analysis assesses a buffer of ~~1,000~~1,210 yards. ~~After taking into account the size of the FSRU, this~~This equates to approximately ~~660~~950 acres.

As reported by the Long Island Sound Study (LISS) in 2006, there are approximately 844,800 total acres in Long Island Sound (LISS 2006). Assuming 20% of this total area is removed because it is not suitable for recreational boating due to the proximity to shore, depth of water, or other obstructions, 675,840 acres of adequate boating water still remains. Table E-17 compares the percent total of the ~~potential~~recommended safety and security zone with the total adequate boating area of Long Island Sound.

**Table E-17 Percentage of Navigable Water in Long Island Sound**

<u>Recommended</u> Security Zone	Acres in Zone	% of Total Long Island Sound
<del>1,000</del> <u>1,210</u> -yard buffer	<del>594</del> <u>949.7</u>	<del>0.07</del> <u>0.11</u> %

The safety and security zone ocean area that would potentially be off limits to recreational boating represents a minute portion of the total usable navigable water in Long Island Sound; and the region gains a valuable resource – natural gas.

Other than sailing in regattas, recreational boaters typically do not follow a specific course and would be able to alter their heading to avoid the FSRU and any established safety and security zone without significantly or adversely impacting their trip.

Some recreational boaters may choose to avoid the area surrounding the FSRU completely. Due to the location of the proposed FSRU site in the middle of Long Island Sound and the closest coast being approximately 9 miles away, it is assumed that recreational boaters who would prefer to avoid the FSRU have the ability to do so, i.e., the FSRU is not located directly offshore from a port where recreational boaters would have no choice but to pass close to the FSRU and the safety and security zone.

The number of recreational boaters that would choose to not boat on Long Island Sound due to the presence of the Broadwater Project, who would either move to another body of water or not boat at all, is assumed to be minimal and would not have a significant impact on the overall established current economic impact.

**Recreational Sportfishing.** As discussed above, the proposed FSRU and the associated safety and security zone would occupy only a small portion of Long Island Sound. Table E-17 presents a breakdown, in acres, of Long Island Sound waters that would no longer be accessible to anglers for sportfishing.

Sportfishing participation rates have been decreasing since 1994 according to the 2001 New York State Sea Grant study. With this decrease in the overall number of anglers, the conclusion could be drawn that there has been an overall decrease in competition for fishing areas in Long Island Sound. Thus, sportfishermen would likely be able to find adequate fishing locations in Long Island Sound outside of the safety and security zone that would be associated with the FSRU.

The Stratford Shoal area, which is a popular fishing location and has high fisherman boat traffic, as noted in the Boat Traffic Survey, is approximately 12 miles away from the proposed FSRU location. There would be no conflict between the proposed Project and sportfishing in the Stratford Shoal area.

### **Long Island Tourism**

Information on Long Island Sound based recreational activity was covered in previous sections. This section provides additional background information and economic data related to the tourism industries that support both offshore and land based recreational activities and attractions for out of town visitors.



The tourism “industry” can be comprised of firms that fall mostly within the retail trade sectors. Environmental and natural resource based amenities on Long Island serve to attract visitors from outside the region who then spend money on goods and services within Suffolk and Nassau Counties. The tourism spending is amplified by overnight stays and attractions and visits that require overnight lengths of stays.

The region possesses a tourist infrastructure comprised of hotels/motels/bed & breakfasts and Inn and restaurants and other support services that cater to tourists. An area’s historic character or market “branding” can define the resources that attract tourists. Out of town visitors bring in new or imported dollars to a region and their spending contributes to economic growth in a region and supports other dependent industries and households. Eastern Long Island has always attracted visitors from the NYC metro area who view the less developed parts of the Island as a weekend or even day retreat or getaway destination.

Industrial and commercial activities that are considered low impact or benign serve to leave the region’s particular “brand” untarnished. This is because these activities are not located in high profile areas that serve to attract out of town visitors.

### **Background Activity**

It is estimated that the 20 New York State-managed parks and historic sites (along with other locally run municipal parks) on Long Island attract nearly 20 million visitors annually. Many of these sites are located in Nassau County, close to New York City, or on the far eastern end of Long Island (New York State Office of Parks 2006). The attractions on Long Island are the coastal areas and bays for swimming, fishing, boating and other beach recreational activities, in addition to golf destinations, wine tours, inland hiking, biking and camping, and general sightseeing tours.

Specific popular attractions in Suffolk County, NY include the Vanderbilt Museum, Walt Whitman Historic Site and the Stony Brook Grist Mill in the “North Shore” area. Central Suffolk attractions include a top-rated water park, Splish Splash, and the Atlantis Marine World aquarium in Riverhead, NY. In eastern Long Island, the two “forks” each offer unique attractions. North Fork is more rural, with vineyards, farm stands and smaller villages. South

Fork is the location of the more exclusive Hamptons, which includes upscale dining and shopping (LICVB 2006).

The Long Island wine industry is a growing tourist destination which has received significant attention and funds over the past decade. There are 38 licensed wine producers on Long Island, 33 of which are located on the North Fork (30 on LI and 26 on North Fork are open to the public). It is estimated that there are approximately 500,000 visitors to the East End wineries annually (Long Island Wine Country 2006).

Access to Long Island can also be gained through use of buses, trains, ferries or personal vehicles or plane. Airports generally serving tourists coming to Long Island include the following:

JFK International Airport	LaGuardia Airport
Brookhaven Airport	Republic Airport Farmingdale
Lufker Airport East Moriches	East Hampton Airport
Islip Airport	Mattituck Airport
Francis S. Gabreski Airport Westhampton	Montauk Airport
Long Island MacArthur Airport	

Source: Long Island Browser 2006.

Tourism-related employment figures for New York State and Long Island (Nassau and Suffolk Counties) are presented in Table E-18. As indicated in the table notes, the tourism-related employment data is estimated from a "Travel & Tourism Cluster" of industries, which are then prorated based on assumptions of purchases and spending directly related to tourists (not residents). Thus, the figure of 38,130 pro-rated 2004 Long Island employment is representative of jobs that cater directly to non-resident, out-of-town tourists visiting local attractions.

**Table E-18 Tourism Related Employment and Wages for New York State and Long Island (2004)**

	Pro-Rated Employment	Pro-Rated Total Wages	Average Wages
<b>New York State</b>	<b>333,530</b>	<b>\$10,818,540</b>	<b>\$32,400</b>
<b>Long Island</b>	<b>38,130</b>	<b>\$1,105,120</b>	<b>\$29,000</b>
Nassau	19,380	\$581,191	\$30,000
Suffolk	18,750	\$523,930	\$27,900

Source: N.Y. State Dept. of Labor 2006.

Notes:

1. ESD counts 70 6-digit NAICS-based industries as part of the Travel & Tourism Cluster; this industry list is further broken down into 5 sub-clusters including: 1) Travel Retail; 2) Passenger Transportation; 3) Culture, Recreation and Amusements; 4) Accommodations; and 5) Food Services.
2. As it has for the past few years, ESD pro-rates industry employment and wages data by only counting that share of employment and wages in an industry attributable to purchases made by tourists. Share estimates were developed by the BEA (For example, according to the BEA, approximately 20 percent of all food and beverage purchases are made by visitors, while the remaining 80 percent are made by local residents.)
3. Pro-rated County and regional travel & tourism employment and wages data for 2004 are attached. Also included is a list of tourism industries and their respective pro-ration shares.

Although tourism is a major industry in Long Island, generating an estimated \$65 million in annual sales, it is not a major source of employment in Nassau and Suffolk Counties.

### **Potential Economic Impact from the Broadwater Project**

Negative impact to historic tourism levels and associated spending from the proposed Project is not expected. The Project will not affect the Long Island area's natural resources and amenities that serve to attract tourists. The Project will be sited at a significant distance from any coastal areas that would attract tourism. In addition, land based activities to support Broadwater will be small and low impact in scope. Because no adverse impact is expected, the Project is not expected to have any effect on the regional "branding" that defines the tourist experience on Long Island. The level of spending that is derived from tourism is expected to be unimpeded by the Project.

It would take a significant, protracted change in commercial and industrial activity and development to affect the particular "brand" that defines Eastern Long Island. Open spaces and access to water are amenities that "brand" this part of Long Island.

The marketing appeal and branding for a sub-area such as a wine country area will not be impacted by offshore commerce. In addition, ecologically fragile areas that function as regional eco-tourist attractions such as the North Fork and the Pine Barrens (*see* Figure 1-8 for geographic reference) would not be impacted by the Project. As long as the resources that attract tourism remain intact, the tourist based economic sectors that depend on this visitation will not be impacted.

## **2.0 ONSHORE LAND USE**

Broadwater has identified two onshore locations on Long Island that can provide the facilities needed to support the operation of the Project: a waterfront site in the Village of Greenport, and a waterfront site in the Village of Port Jefferson (*see* Figures 2-1 and 2-2). The Village of Greenport is located in the Town of Southold, on the North Fork of Long Island, and Port Jefferson is located in the Town of Brookhaven, on the north shore of Long Island. The permanent onshore facilities will include land required for office space, warehousing, and a waterfront facility. Broadwater expects to lease all onshore facility space; no fee simple land acquisition is proposed.

### **2.1 Port Jefferson**

The existing waterfront and docking facilities located at the proposed Port Jefferson site are adequate to address the needs for temporary facilities related to construction of the Project. As such, no new additional facilities will be constructed and, therefore, no related environmental impacts or conflicts are anticipated.

#### **2.1.1 Land Use**

Port Jefferson's waterfront area is also known as its downtown. This area is comprised of a mix of land uses, including waterfront, industry, commercial, residential, and government (*see* Figure 2-3). The Village has developed over recent years and has begun to take on a tourist center character, revolving around the Port Jefferson ferry terminal, restaurants, and shopping centers. According to the Port Jefferson Harbor Complex Harbor Management Plan (HMP) (Village of Port Jefferson 1999), there has been a slow transition of Port Jefferson Harbor from a mostly industrial waterfront to one characterized by a mix of land uses, including recreational, commercial, industrial, and residential, which has resulted in conflicts and congestion within the harbor. Despite this, however, the proposed usage of properties by Broadwater for Project-related activities is allowable and encouraged under the Village's and Town's planning documents (Village of Port Jefferson 1999) and will be consistent and compatible with existing land use patterns in the area.

### **2.1.2 Zoning**

The Port Jefferson site is currently zoned primarily as M-W (Marina Waterfront) (see Figure 2-4). The M-W zoning designation allows for land uses that support water-dependent uses such as marinas and docks. Other surrounding zoning includes C-G (General Commercial) to the south and R-2 (One- and Two-Family Residential) to the west and east (Suffolk County Planning Department 1997). Therefore, the facilities proposed in support of the Project will be consistent with existing zoning.

### **2.1.3 Coastal Zone Management**

The proposed site for permanent Project facilities in Port Jefferson is located within the Long Island Sound Coastal Zone Management Area. According to the NYSDOS, Port Jefferson does not have an approved Local Waterfront Revitalization Program (LWRP) (Saske 2005). Port Jefferson does have a current HMP, which is maintained by local municipalities bordering the harbor complex. The Port Jefferson HMP provides a comprehensive environmental, ecological and natural resources evaluation of the harbor and identifies existing sources of impacts on sensitive harbor resources. The HMP is also used as a planning tool for the bordering municipalities to guide future development within the HMP area. Port Jefferson's HMP also provides information on land use and ecological resources in the planning area. Although the majority of the proposed site consists of marine commercial/industrial shoreline type parcels, sensitive ecological resources include large bluffs occurring in various locations adjacent to Port Jefferson Harbor shoreline and adjacent to portions of the Project area.

The Port Jefferson HMP also states that because the amount of commercial waterfront is limited and concentrated in specific areas, priority for development should be given to water-dependent and water enhanced uses in these areas in order to provide the greatest economic benefits. In the Harbor Issues and Recommendations section of the HMP, Harbor Objective No. 1 states that the existing uses in lower Port Jefferson Harbor (in the area of the proposed Broadwater onshore facility), such as "boatyard dockage facilities, transshipment and oil transfer facilities, and marinas," are of "vital importance to the economic vitality and historic character of the Village of Port Jefferson and should be enhanced," in a manner consistent with the protection of natural resources in the area spanning Port Jefferson Harbor. The proposed use

of onshore facilities in this location by Broadwater will be consistent and compatible with this key recommendation as stipulated in the Port Jefferson HMP.

## **2.2 Greenport**

Permanent onshore facilities such as office space, warehousing, and a waterfront facility are required at the Greenport site. Leasing of all needed onshore facility space is anticipated; no land acquisition is proposed at Greenport. The intended use of the facilities for these purposes is expected to be the same as their current use, as discussed below. Therefore, no related environmental impacts or conflicts are anticipated at the Greenport site.

### **2.2.1 Land Use**

The specific parcels proposed for permanent facilities in Greenport fall within areas designated as Waterfront Area 1 and Waterfront Area 2, which include the following mix of land uses: marine commercial (9.2 acres [56.9%]), vacant disturbed abandoned (2.8 acres [17.2 %]), institutional (0.39 acres [2.4%]), and commercial (3.8 acres [23.5%]) (*see* Figure 2-5). The surrounding uses include commercial and marine commercial to the north, village residential to the west and south, and open water (Greenport Harbor) to the east (U.S. Office of Ocean and Coastal Resource Management 1996). In addition, the proposed onshore facilities are located in an area designated as marine commercial under the Village of Greenport's future land use map. According to the Village of Greenport's LWRP, marine commercial uses in Waterfront Areas 1 and 2 currently include a variety of water-dependent businesses and activities, including but not limited to: retail and wholesale seafood product manufacturers; facilities for offloading fish from commercial vessels; dockage for transient vessels; and marine supply facilities (U.S. Office of Ocean and Coastal Resource Management 1996). Based on the existing usage within Greenport's Waterfront Areas 1 and 2, the proposed Project-related activities are expected to be consistent and compatible with existing land use patterns in the area.

### **2.2.2 Zoning**

Currently, the Greenport site is primarily zoned W-C (Waterfront Commercial), with a small portion being zoned C-R (Retail Commercial) (*see* Figure 2-6). Other zoning designations adjacent to the proposed site include R-A and R-B2 (Residential) to the east and west, and C-1 (Central Commercial) to the south. The W-C zoning designation allows for uses

supporting water-dependent uses such as marinas and docks. Therefore, the facilities proposed in support of the Project will be consistent with existing zoning (U.S. Office of Ocean and Coastal Resource Management 1996).

### **2.2.3 Coastal Zone Management**

The proposed site for Project facilities in the Village of Greenport is located within the Long Island Sound Coastal Zone Management Area, as well as within the boundaries of the Village of Greenport's state and federally approved LWRP. The goals of the Greenport LWRP are to protect and maintain water-dependent uses, revitalize underutilized waterfront areas, strengthen Greenport as a commercial fishing seaport, provide for public access to the waterfront, and enhance the village as a commercial and business center (U.S. Office of Ocean and Coastal Resource Management 1996). Because the proposed Project waterfront facilities will be used for the marine transfer of people, equipment, and FSRU support vessels, the use is a water-dependent use consistent with the Greenport LWRP.



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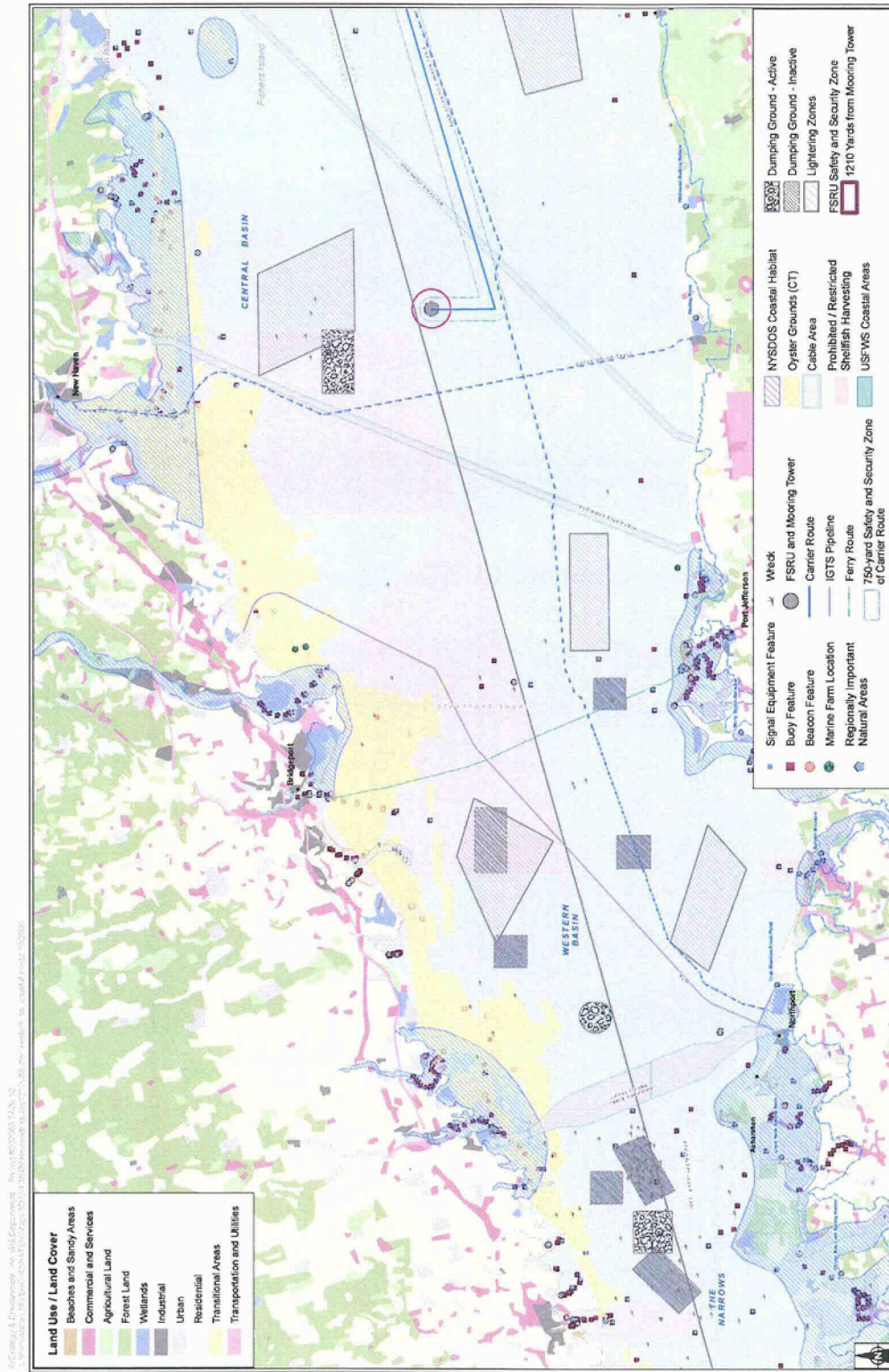


Figure 1-1 Land Use / Coastal Areas and Navigation Features  
 Central Long Island Sound

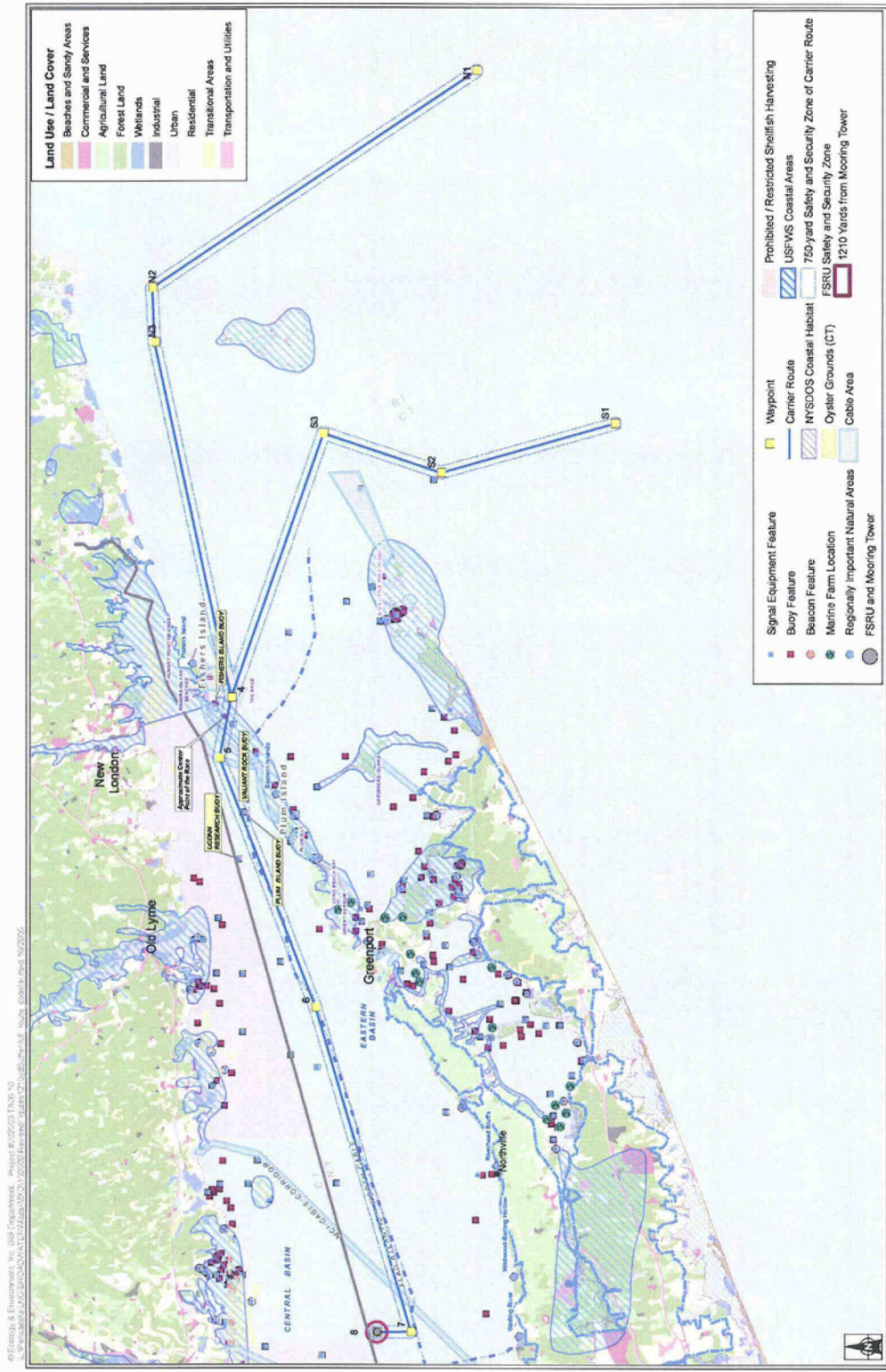
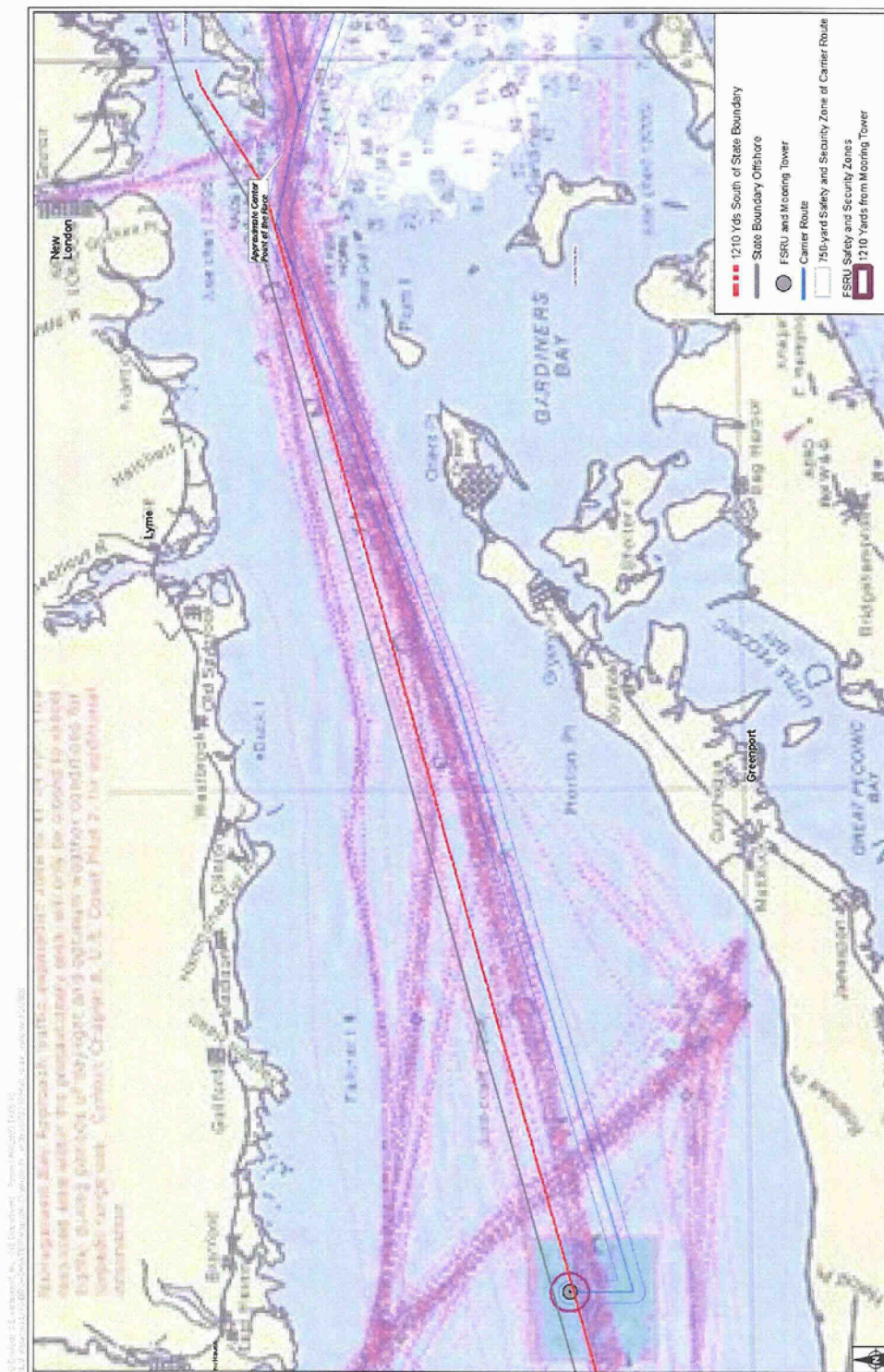
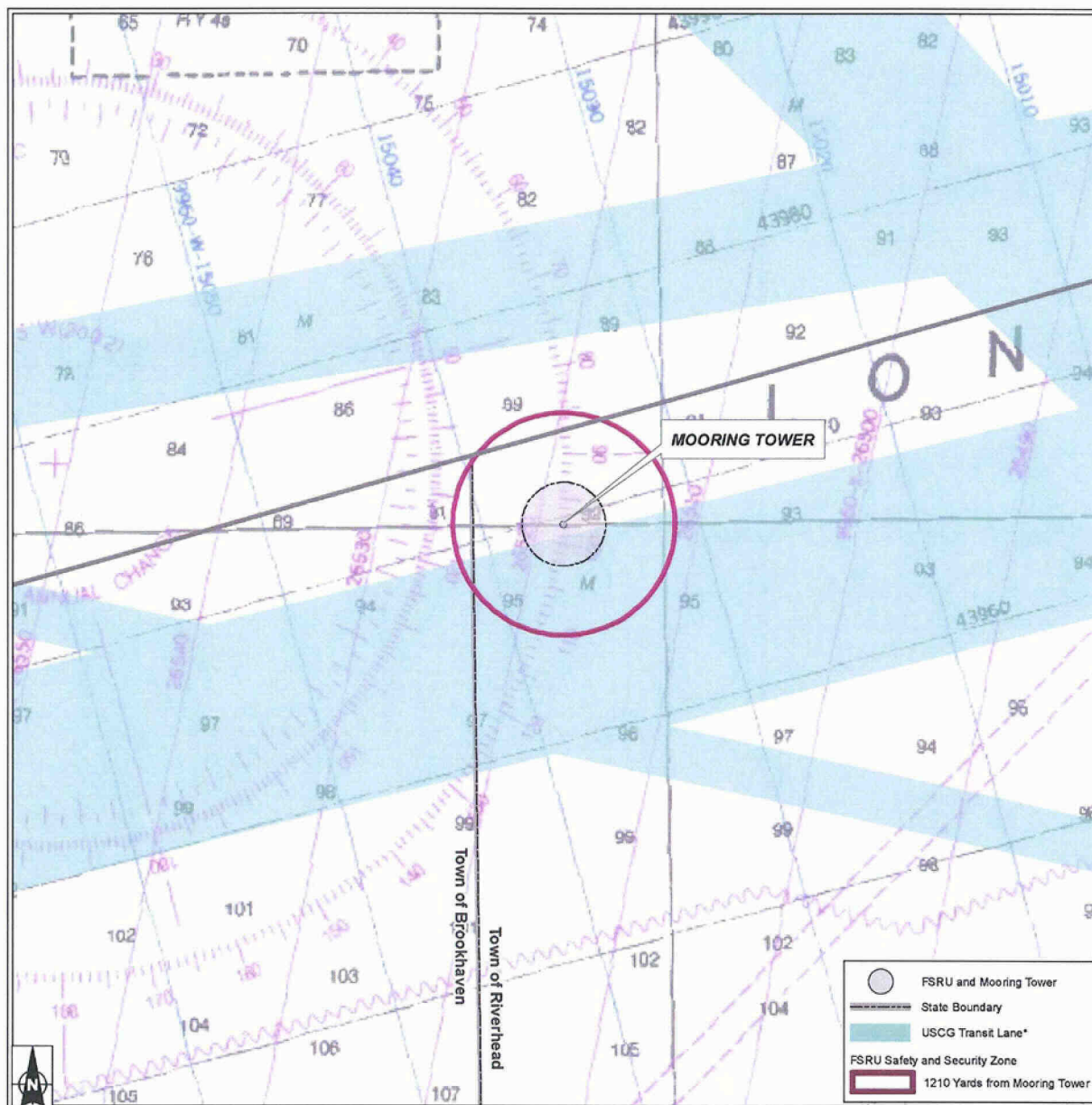


Figure 1-2 Land Use / Coastal Areas and Navigation Features  
Eastern Long Island Sound







\*The information presented for transit lanes was generated from USCG data gathered as part of the PANSAs report for the Broadwater Project, and do not represent defined transit boundaries

**Figure 1-4 USCG Transit Lanes  
 Surrounding Proposed FSRU**

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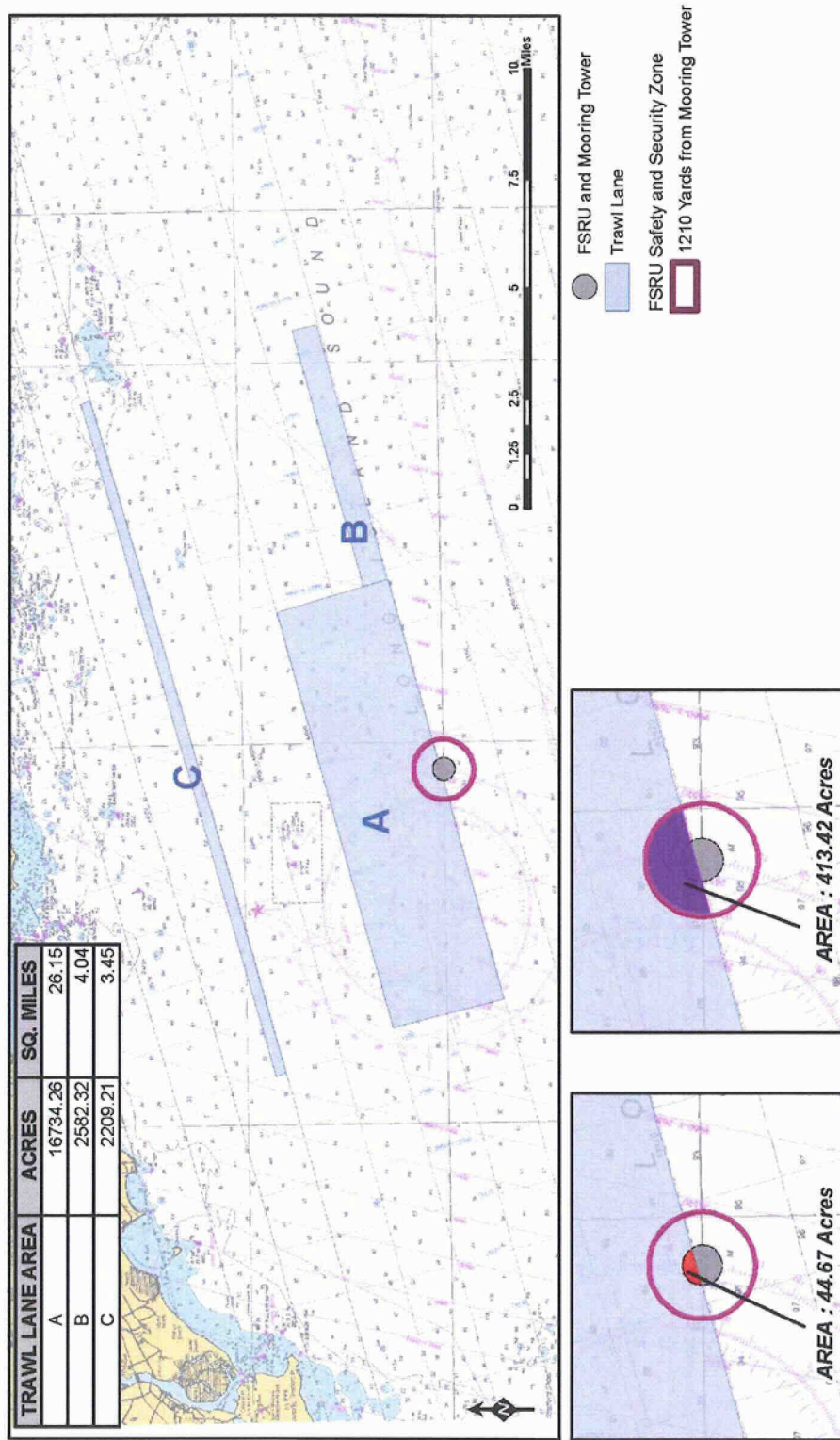
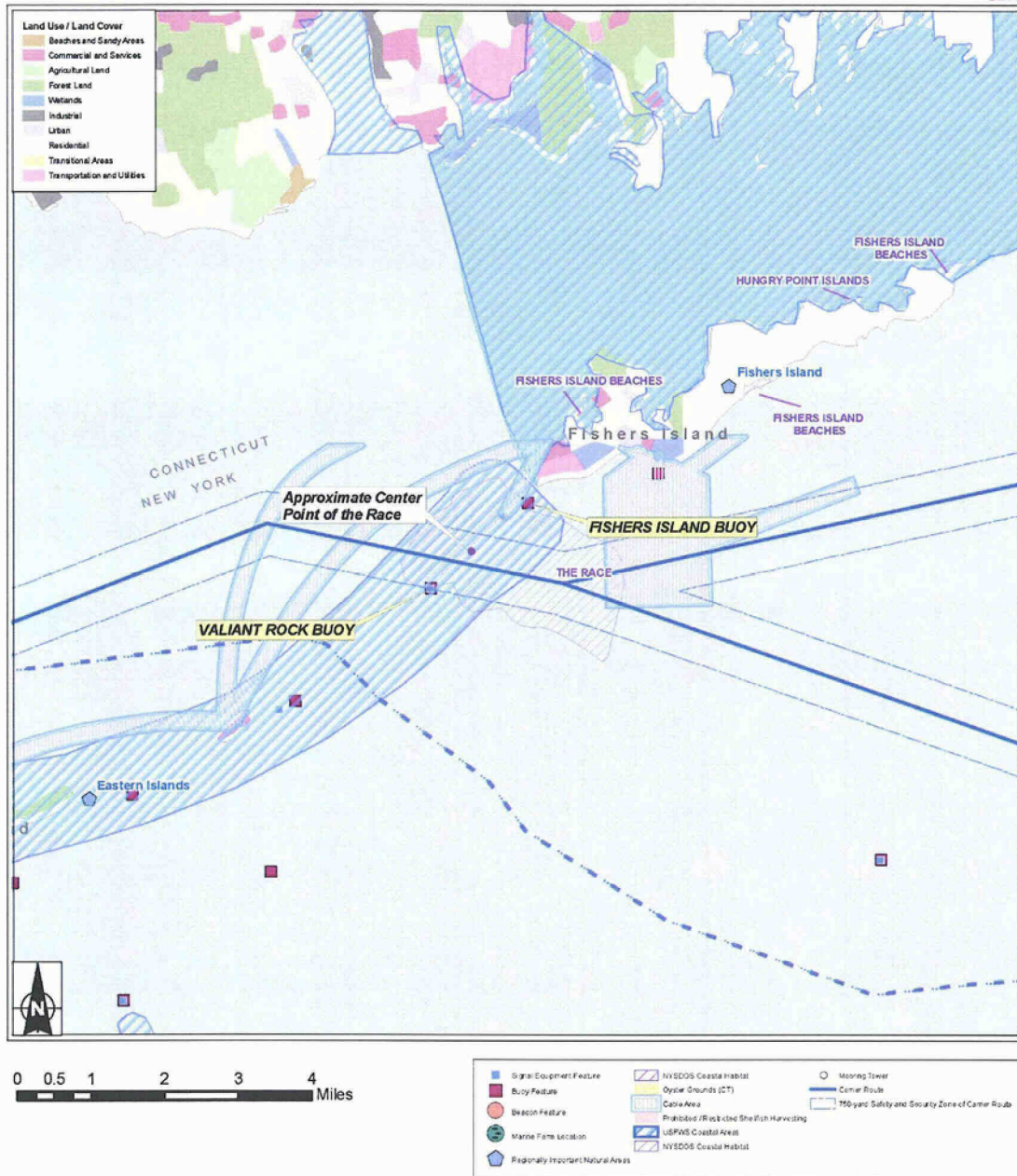


Figure 1-5 Area of Trawl Lanes Surrounding Mooring Towers





**Figure 1-7 Coastal Areas and Navigation Features  
 "The Race," Long Island Sound**

## **APPENDIX F**

# **COMMERCIAL FISHERIES, RECREATION, AND LONG ISLAND SOUND DEPENDENT COMMERCIAL ACTIVITIES - AN ECONOMIC ANALYSIS**

**REVISED  
~~April~~October 2006**

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BLS	Bureau of Labor Statistics
Completion Report	“Fishery Dependent Monitoring of the American Lobster Off the East End and South Shore of Long Island, NY, for the period July 1, 2002 through June 30, 2003”
CPI	Consumer Price Index
CTDEP	Connecticut Department of Environmental Protection
EE	East End of Long Island
E & E	Ecology and Environment, Inc.
ELIS	Eastern Long Island Sound
FSRU	floating storage and regasification unit
IMPLAN	Impact Analysis for Planning
LICVB	Long Island Convention & Visitors Bureau and Sports Commission
LIS	Long Island Sound or Sound
LISWTP	Long Island Sound Waterborne Transportation Plan
LNG	liquefied natural gas
MIG	Minnesota IMPLAN Group, Inc.
NMFS	NOAA National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NYSDEC	New York State Department of Environmental Conservation
SS	South Shore
WLIS	Western Long Island Sound

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## **1.0 INTRODUCTION**

The analyses contained in this report responds to supplemental questions on how the proposed Project will potentially impact key Long Island Sound (Sound or LIS) coastal zone resources from an economic perspective. The analyses use information contained in several Broadwater Resource Reports as well as newly-acquired materials to estimate economic impacts associated with commercial fisheries (lobster), recreation, and LIS-based navigation dependent industries as well as the finding of the U.S. Coast Guard set forth in the Waterways Suitability Report (WSR).

## **2.0 COMMERCIAL FISHERIES – LOBSTERS**

This section collates and summarizes select officially compiled data that describes the historical evolution of the Long Island Sound based commercial lobster fishing industry. The data assembled reflects important trends that are considered and used in developing an impact estimate attributable to the loss of access to an area of the Sound used for lobster fishing as a result of the ~~anticipated 1,000 yard U.S. Coast Guard-designated~~ **recommended 1,210 yard** safety and security zone for the floating storage and regasification unit (FSRU).

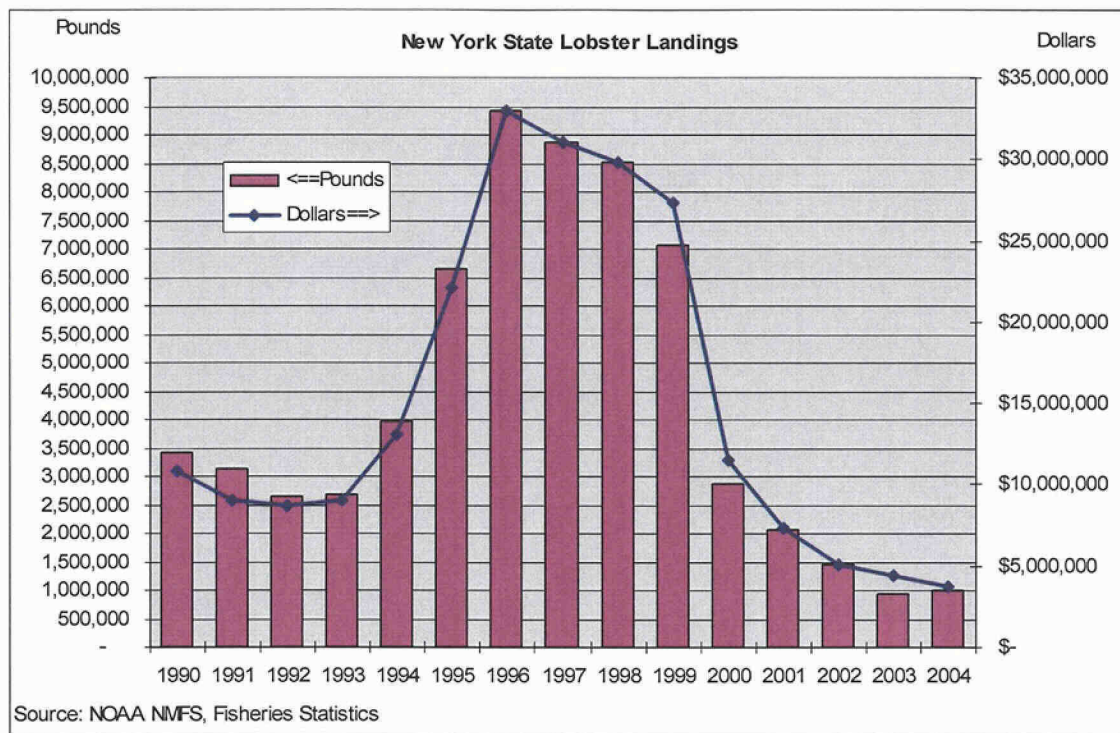
### **2.1 Background Historical Market Context and Key Recent Trends**

#### **2.1.1 NOAA Fisheries Statistics for New York State**

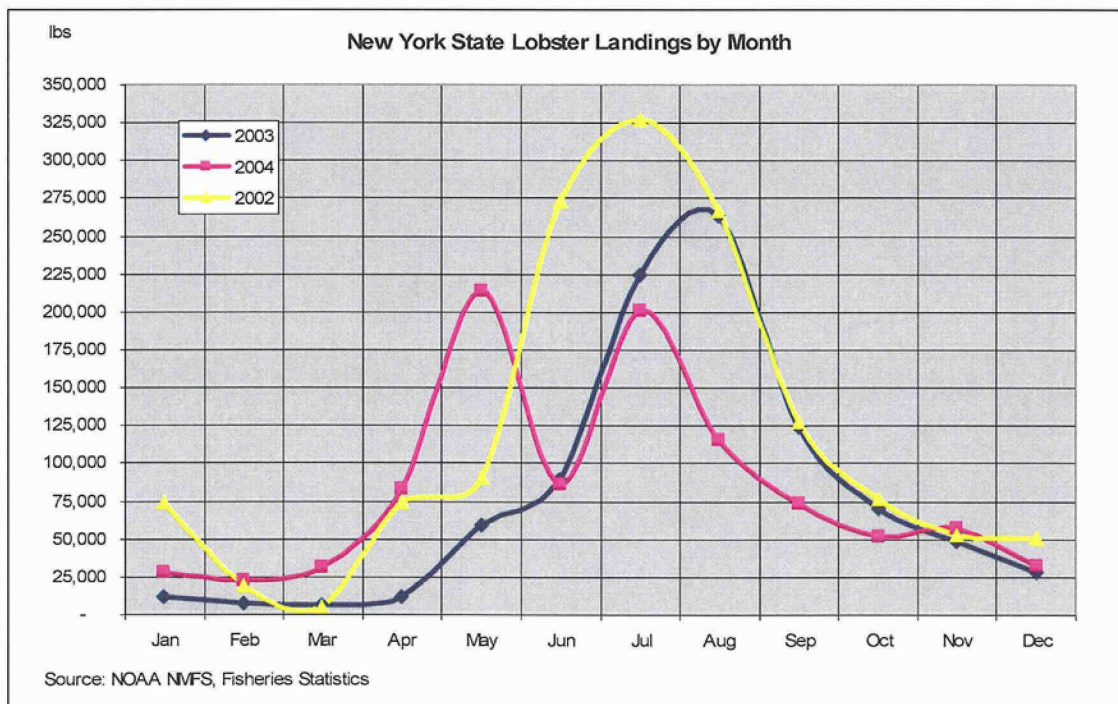
Most of the lobster caught by the New York lobster industry is in Long Island Sound. The New York State Department of Environmental Conservation's (NYSDEC) most recent data show that about 82% of all New York commercial landings are from the Sound (NYSDEC, 2004). Historically, the share attributable to Sound landings has been above 90%. The following exhibits and tables describe available data and information compiled from the NOAA National Marine Fisheries Service (NMFS) Fisheries Statistics dataset and data from the NYSDEC's Fishery Dependent Monitoring sampling program for the American Lobster off the East End and South Shores of Long Island, NY.

Figure 2-1 plots the annual pounds of commercial lobster landings and values for New York State since 1990. In 1996, the dockside value of lobster landings reached almost \$33 million, reflecting landings of 9.4 million pounds. Most recently, for 2004, the total pounds landed by the New York lobster fishing industry reached almost one million pounds and had a dockside value of \$3.74 million dollars. Prices per pound for the American Lobster have been trending upwards since 1990 and have averaged over \$3.5 dollars per pound in the last several years. The figures reflect the lobster mortality or die-off of 1999 and show the sharp declines in landings especially since 1999. In recent years, however, the populations appear to have stabilized according to the most recent monitoring and sampling activities (NYSDEC, 2004).

In New York, most landings occur during May through August of the year with peak production in either July or August. Figure 2-2 shows the monthly landings for New York from 2002 – 2004.



**Figure 2-1 New York State Lobster Landings**



**Figure 2-2 New York State Lobster Landings by Month**  
**Summary of 1999 Study on Economic Contribution of Lobster Fisheries**

This section summarizes past research that estimated the total economic impact of the commercial lobster industry to NYS, based on the initial value of commercial lobster

landings. The research was completed by Techlaw Inc. as part of a New York Sea Grant and was entitled, "The Economic Contribution of the Sport Fishing, Commercial Fishing and Seafood Industries to New York State" (Techlaw Inc., 2001).

This research used the same NMFS lobster landings data summarized above (1999) as inputs (the direct economic impacts) to estimate the total economic impacts to NYS. It also used a standard economic impact model, Impact Analysis for Planning (IMPLAN) that was also employed in Broadwater Resource Report No. 5, Socioeconomics. Total economic impacts take into account the spending impacts from landings revenues that cycle through the economy. The revenues (the value of lobster landings) can be spent on boats and related equipment, repairs, fishing gear, bait, ice, fuel and other expenses required to sustain commercial operations.

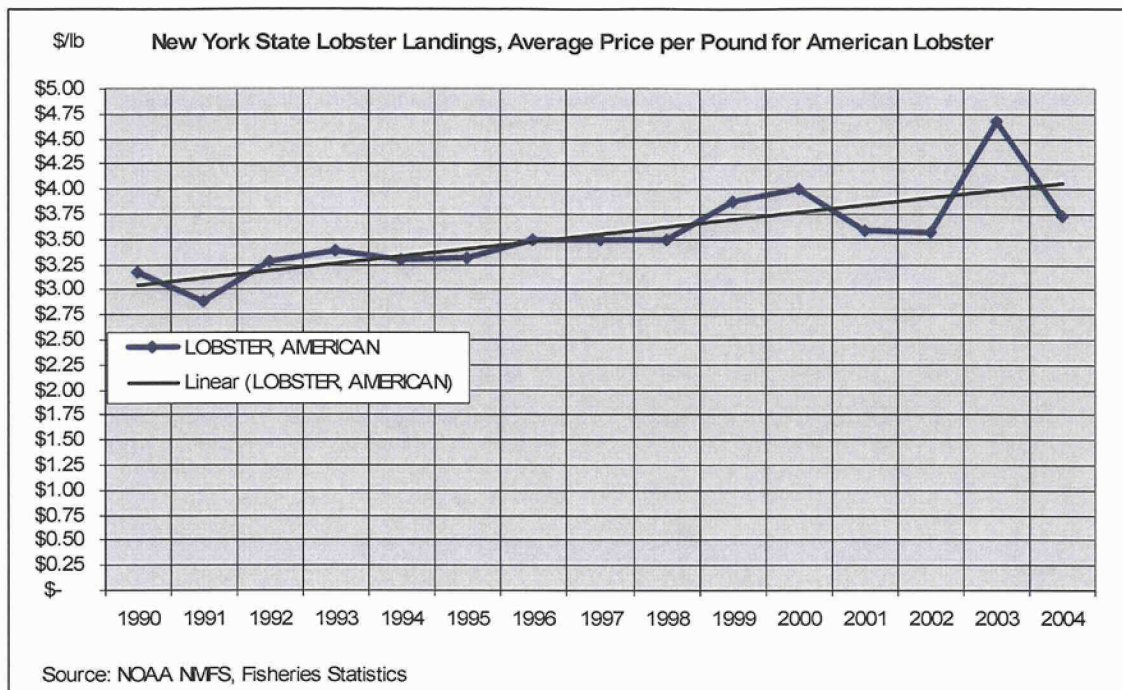
Table F-2-1 summarizes the results of the Techlaw study.

**Table F-2-1 Contribution of New York Commercial Fishing to State Economy, 1999, Dollar Value**  
(Millions of 1999 dollars)

		(1)	(2)	(3)	(4)	(5)
Commercial Fishing Species or Gear Type		1999 Value of Landings	Impact on Sales of Goods and Services	Total Contribution	Economic Impact Multiplier = [Total Contribution/Value of Landings]	Percent Breakdown of Economic Impact
1	Lobster, inshore	\$21.80	\$21.30	\$43.10	1.98	28.8%
2	Lobster, offshore	\$5.50	\$5.40	\$10.90	1.98	7.3%
3	Mollusks, shellfish	\$26.90	\$26.20	\$53.10	1.97	35.5%
4	Surf clam dredges	\$2.20	\$2.30	\$4.50	2.05	3.0%
5	Inshore fisheries	\$3.80	\$3.70	\$7.50	1.97	5.0%
6	Multi-species trawlers	\$11.60	\$10.80	\$22.40	1.93	15.0%
7	Longline	\$4.20	\$3.90	\$8.10	1.93	5.4%
8	Great Lakes	—	\$(1.00)	NA	NA	NA
9	Aquaculture	\$1.90	\$(1.00)	NA	NA	NA
10	Total commercial fishing	\$77.90	\$71.60	\$149.60	1.92	100.0%

Table F-2-1 shows the results of the economic contribution study for all commercial fisheries landings including lobster for NYS. The lobster segment is highlighted in gray. The economic impact estimates were based on the value of 1999 total lobster landings that are also portrayed in Figure 2-1 for 1999. In Figure 2-1, the line point for total lobster landings for 1999 is equal to the sum of lobster landings-in shore, (\$21.8 million), plus lobster landings-offshore (\$5.5 million), that are broken out in Table F-2-1. The line point in Figure 2-1 for 1999 is equal to the combined value of inshore and offshore landings of \$27.3 million.





**Figure 2-3 New York State Lobster Landings, Average Price per Pound for American Lobster**

The economic impact estimate reflects catch data before the full effect of the lobster die-off had run its course. The 1999 economic impact estimates shown in Table F-2-1 were based on a population that had yet to be fully impacted by the lobster die-off. The relatively higher level of lobster landings for 1999 resulted in larger total economic impacts than would have been the case in subsequent years, when the lobster die-off impact was visible in lower landings catch figures. Total economic impacts are based on the value of lobster landings that are considered the direct effect before any multiplier is applied. The second column of Table F-2-1 reflects the indirect and induced impacts from the spending of revenues on supplies and equipment to sustain commercial operations. The total contribution column represents the total economic impact and is the sum of columns 1 plus 2. The economic impact multiplier is shown in column (4) and is the ratio of the Total Contribution (3) to the 1999 value of landings (1).

In 1999, the lobster industry accounted for 36% of the total economic impact to NYS based on landings that comprised 28% of the share of total commercial fishery landings (see Table F-2-1). Since total economic impact estimates are proportional, Table F-2-1 can be used to estimate the total contribution from landings associated with the Sound areas that would be restricted because of the Broadwater Project's safety and security zone. However, Ecology &

Environment Inc. (E & E) also applied the IMPLAN model software to the most recent lobster landings figures, so the two studies are comparable.

### 2.1.2 NYSDEC Lobster Landings Data

The NYSDEC also compiles data on commercial lobster landings in New York as part of its monitoring activities for the American Lobster species. (see “Fishery Dependent Monitoring of the American Lobster Off the East End and South Shore of Long Island, NY” [for the period July 1, 2002 through June 30, 2003]) (“Completion Report”) (McKown et al. 2004). The NYSDEC data reflect similar trends to the NMFS data and also provides information about the particular sub-areas within New York and Long Island Sound for the landings and equipment deployed.

Figure 2-4 compares the NMFS data to the NYSDEC resident commercial lobster landings time series in pounds. The time series show that the declining trends in landings have stabilized or leveled off in recent years.

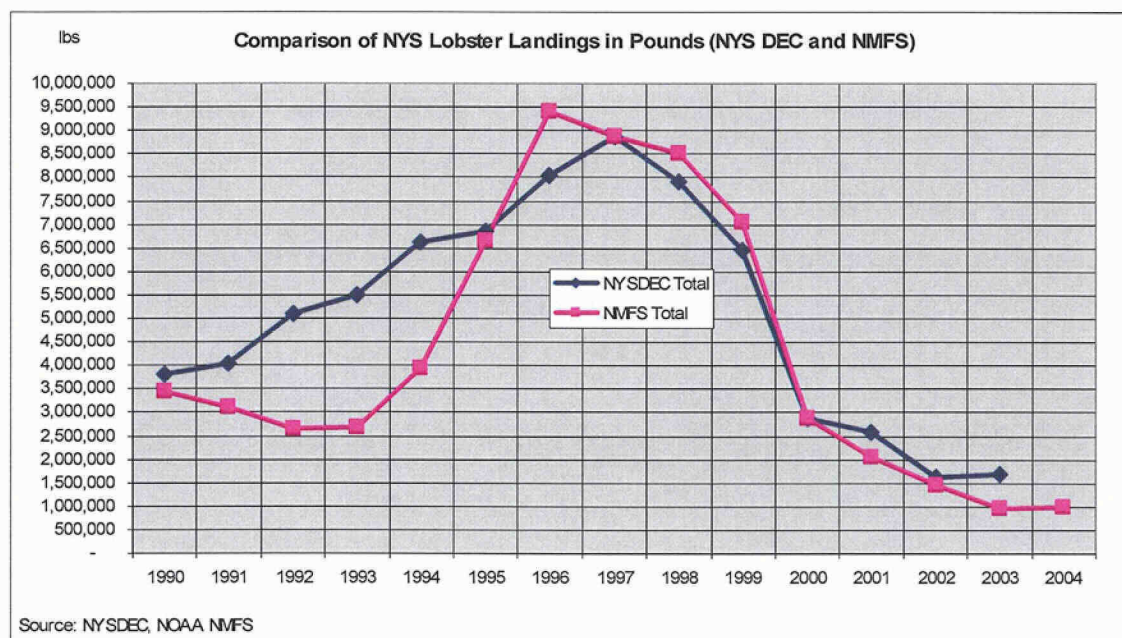


Figure 2-4 Comparison of NYS Lobster Landings in Pounds (NYSDEC and NMFS)

### 2.1.3 Long Island Sound Lobster Landings by Area

Figure 2-5 reproduces the NYSDEC Long Island Sound and Vicinity Fishing Area Chart. In reading Figure 2-5, the following legend should apply:

- WLIS = Western Long Island Sound
- ELIS = Eastern Long Island Sound
- EE = East End of Long Island
- SS < 3 = South Shore out to three miles
- SS > 3 = South Shore beyond three miles

Figure 2-6 shows the shares of total NYS commercial lobster landings taken by sub-area. Activity within the Eastern LIS sub-area is most relevant, as this area would contain the Broadwater Project footprint. More detailed landings data within each sub-area is not available from the NYSDEC.

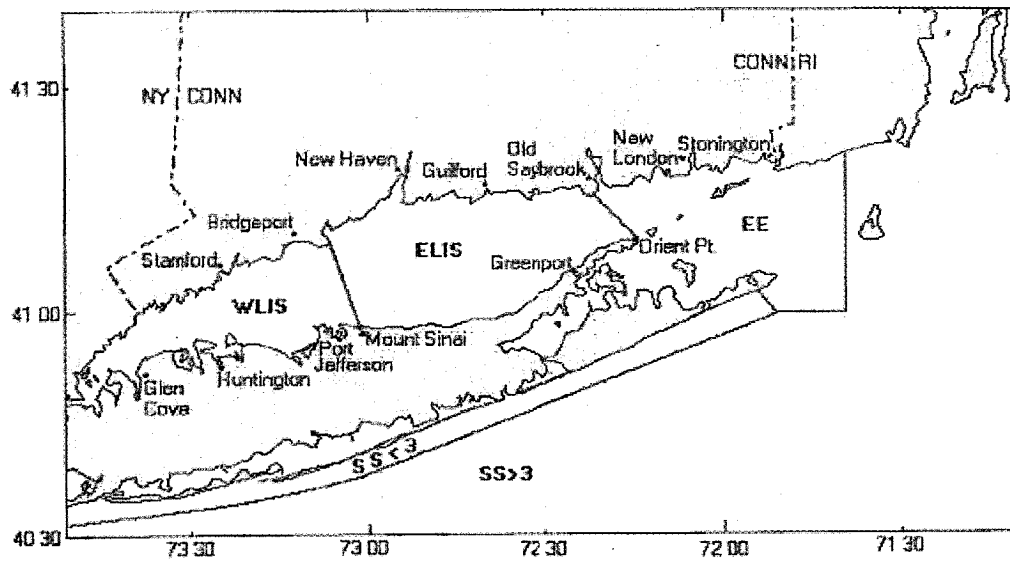
Figure 2-6 also shows the share of commercial lobster landings (as a % of NYS Total) corresponding to each sub-area within the Sound as well as the South Shore. The Western portion of the Sound was most impacted by the lobster die-off and the share of landings fell from over 50% in 1998 to about 25% in recent years. The share of landings for the Eastern LIS area is also about a quarter of all landings, but grew as high as 45% up until a few years ago. The shares of South Shore (beyond the three mile area) and East End of LIS landings have also been rising in recent years. Table F-2-2 shows the lobster landings in pounds for each sub-area within NYS.

The NYSDEC data and Completion Report does not contain any information on the value of landings. To determine the value of landings by sub-area within NYS, E & E applied the NMFS unit value data (\$/lb) by year to the relevant landings in pounds by sub-area to calculate the dock side value by sub-area corresponding to the NYSDEC data. The following figures and tables document the information that was relied upon to isolate the relative importance of the local sub-area lobster fisheries activity that would be most relevant to assessing potential impacts from the Broadwater Project.



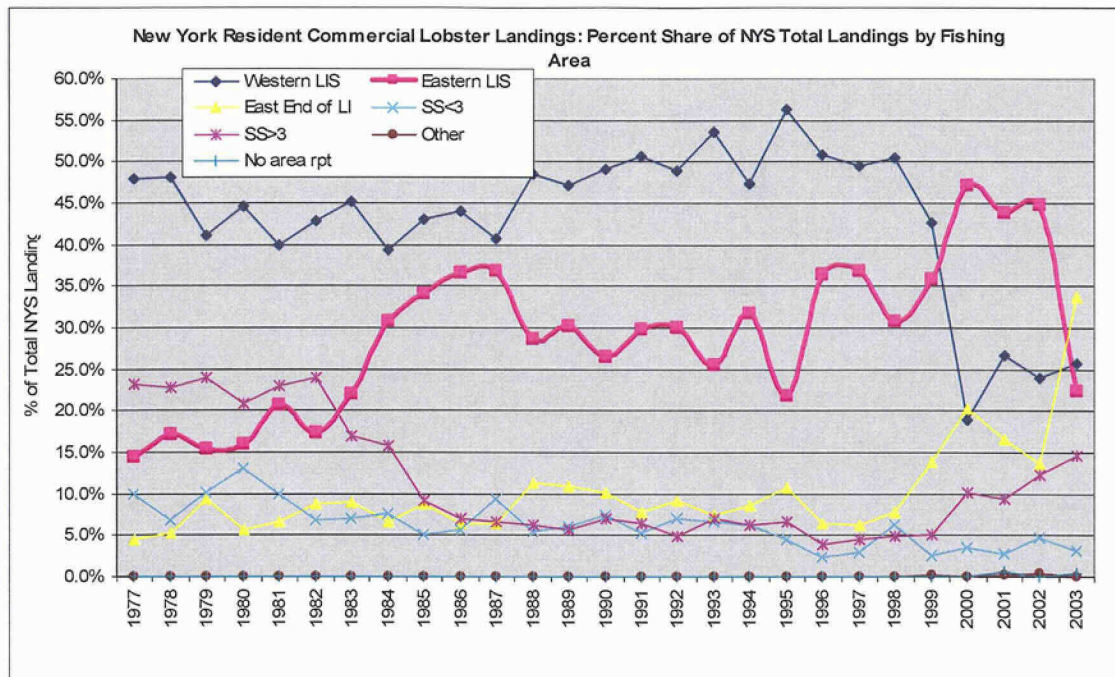
Figure 1.

Long Island Sound and Vicinity Fishing Area Chart.



Source: NYSDEC

Figure 2-5 Long Island Sound and Vicinity Fishing Area Chart



Source: NYSDEC

**Figure 2-6 New York State Resident Commercial Lobster Landings: Percent Share of NYS Total Landings by Fishing Area**

**Table F-2-2 New York State Resident Commercial Lobster Landings (lbs) by Area from 1977-1983**

Year	Western LIS	Eastern LIS	East End of LI	SS<3	SS>3	Other	No area rpt	NY total	LIS Total	LIS Total/ NY Total	ELIS / LIS Total	ELIS / NY Total
1977	272,233	82,091	25,766	56,905	131,165			568,160	380,090	66.9%	21.6%	14.4%
1978	285,934	102,210	30,772	40,805	135,468			595,189	418,916	70.4%	24.4%	17.2%
1979	316,273	117,934	71,639	78,458	184,239			768,543	505,846	65.8%	23.3%	15.3%
1980	361,794	129,445	45,740	106,146	169,247			812,372	536,979	66.1%	24.1%	15.9%
1981	345,080	179,489	57,798	85,278	198,318			865,963	582,367	67.3%	30.8%	20.7%
1982	426,716	173,309	87,209	68,410	238,454			994,098	687,234	69.1%	25.2%	17.4%
1983	648,586	314,518	128,512	100,252	241,821			1,433,689	1,091,616	76.1%	28.8%	21.9%
1984	745,870	582,336	124,568	142,366	297,979			1,893,119	1,452,774	76.7%	40.1%	30.8%
1985	835,448	661,431	170,164	99,648	176,805			1,943,496	1,667,043	85.8%	39.7%	34.0%
1986	772,426	642,841	113,615	100,344	123,526			1,752,752	1,528,882	87.2%	42.0%	36.7%
1987	717,374	646,835	114,033	164,610	115,772			1,758,424	1,478,042	84.1%	43.7%	36.8%
1988	1,199,256	707,664	280,520	133,778	152,754			2,473,972	2,187,440	88.4%	32.4%	28.6%
1989	1,239,989	792,702	289,761	160,890	149,486			2,632,828	2,322,452	88.2%	34.1%	30.1%
1990	1,865,435	1,004,551	383,697	279,872	265,287			3,798,842	3,253,683	85.6%	30.9%	26.4%
1991	2,051,002	1,205,650	313,564	215,576	261,098			4,046,890	3,570,216	88.2%	33.8%	29.8%
1992	2,495,631	1,534,069	472,514	357,699	251,893			5,111,806	4,502,214	88.1%	34.1%	30.0%
1993	2,940,032	1,404,326	407,312	359,595	382,989			5,494,254	4,751,670	86.5%	29.6%	25.6%
1994	3,136,890	2,103,652	573,462	412,944	408,410			6,635,358	5,814,004	87.6%	36.2%	31.7%
1995	3,870,353	1,496,183	741,355	310,551	451,767			6,870,209	6,107,891	88.9%	24.5%	21.8%
1996	4,103,494	2,930,100	521,272	194,618	310,131			8,059,615	7,554,866	93.7%	38.8%	36.4%
1997	4,388,887	3,272,122	552,697	259,100	405,839			8,878,645	8,213,706	92.5%	39.8%	36.9%
1998	3,987,281	2,431,136	611,389	484,963	381,121	1,549		7,897,439	7,029,806	89.0%	34.6%	30.8%
1999	2,749,791	2,315,284	889,715	163,613	328,617	7,685		6,454,705	5,954,790	92.3%	38.9%	35.9%
2000	542,533	1,358,843	585,602	101,456	292,516	2,633		2,883,583	2,486,978	86.2%	54.6%	47.1%
2001	689,159	1,136,705	431,335	70,326	243,457	2,921	15,822	2,589,725	2,257,199	87.2%	50.4%	43.9%
2002	389,988	727,581	220,594	76,112	199,644	7,545		1,621,464	1,338,163	82.5%	54.4%	44.9%
2003	436,927	383,297	575,404	53,229	248,784	-	6,051	1,703,692	1,395,628	81.9%	27.5%	22.5%

### 2.1.4 Lobster Landings by Type of Equipment

Table F-2-3 shows the total pounds of lobster caught by gear type for New York resident commercial lobster landings.

**Table F-2-3 New York Resident Commercial Lobster Landings (lbs) by gear 1998-2003**

Year	1998	1999	2000	2001	2002	2003*
Pots	7,527,616	6,322,407	2,737,876	2,533,305	1,515,840	1,408,206
Trawl	150,930	131,433	113,585	89,392	100,991	233,071
Dive	14,102	11,717	9,807	13,419	4,304	4,522
Pound	469	1,550	2,043	65	147	15,150
Other	4,862	319	1,779	150	70	379
No gear rept	199,475	13,341	13,443	16,821	113	42,419
<b>NY Total</b>	<b>7,897,454</b>	<b>6,480,767</b>	<b>2,878,533</b>	<b>2,653,152</b>	<b>1,621,465</b>	<b>1,703,747</b>
% pots	95.3%	97.6%	95.1%	95.5%	93.5%	82.7%

Source: NYS DEC

Notes: \*2003 preliminary harvest estimate, McKown 3/8/04, 66% reported.

The overwhelming majority of lobsters are caught by pots, also called traps in the nomenclature of the agency reports. In past years, pots have accounted for over 90% of all landings. Between 2002 and 2003, the landings by trawl more than doubled. In the table, the category “Trawl” means a fishing net and does not mean a trawl line with a number of traps. The trawl lines trap arrangements would be reflected in the “Pots” category.

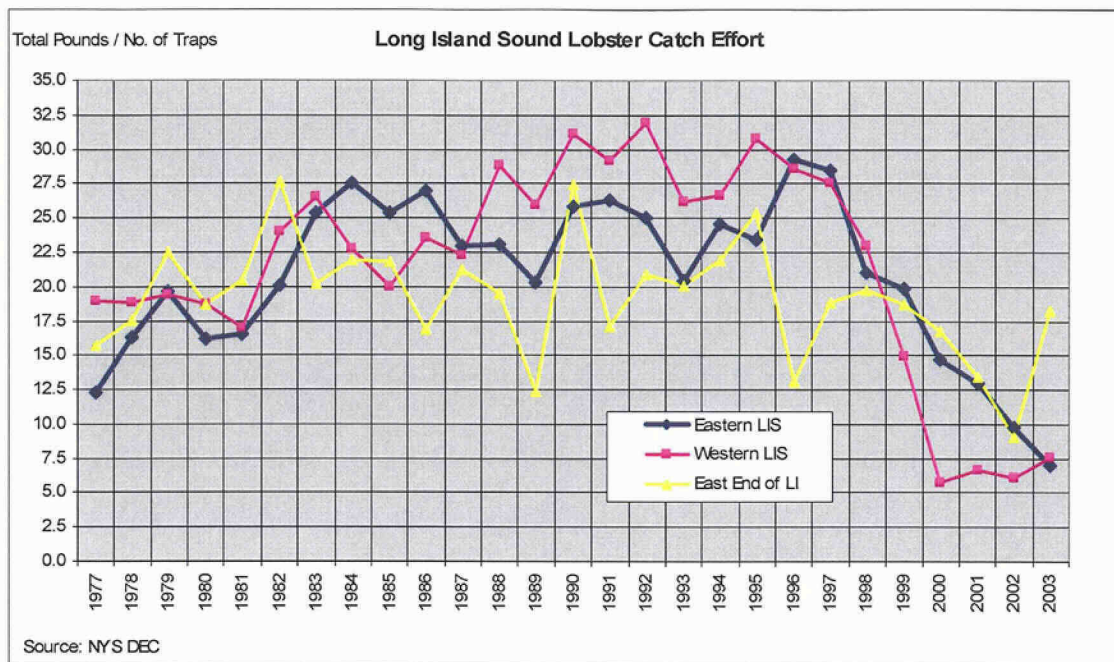
### 2.1.5 Long Island Sound Lobster Catch Effort by Area

The NYSDEC also reported data on the number of lobster traps by each sub-area of Long Island Sound. The number of traps was divided into the total pounds of lobster landings per area to calculate the lobster catch effort, or pounds per trap. Figure 2-7 shows the average pounds per trap for each sub-area.

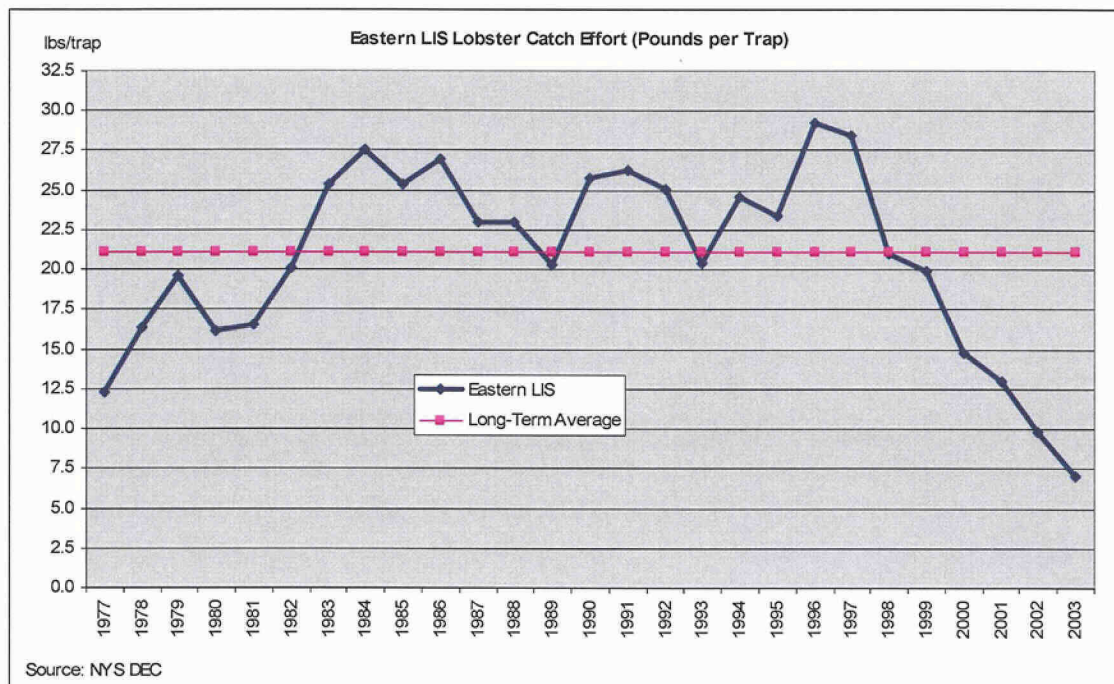
Figure 2-7 shows the historic trends in lobster catch effort. The catch effort for the Eastern portion of LIS has declined to about 7 lbs per trap from over 25 lbs per trap before the 1999 die-off. The long-term historic average, using the years 1977 to 2003, was about 21 lbs per trap and is reproduced below for reference purposes. The 21 lbs per trap figure is also used to bracket or frame a sensitivity analysis on key variables that can affect the estimate of direct economic impacts.

The direct economic impact estimates for the base case scenario use the 7 lbs per trap figure. The historical average is shown as an upper limit bracket for sensitivity analysis purposes.





**Figure 2-7 Long Island Sound Lobster Catch Effort**



**Figure 2-8 Eastern LIS Lobster Catch Effort (pound per trap)**

## 2.2 Direct Economic Impacts – Estimated Value of Lobster Landings Corresponding to the Safety and Security Zone Ocean Area

The following sections estimate the direct economic impacts, defined as the value of lobster landings that would most likely correspond to the recommended circular safety and

security zone surrounding the Broadwater Project's FSRU. ~~At the present time, Broadwater conservatively assumes that the U.S.~~The recommended U.S. Coast Guard-imposed safety and security zone will be approximately 1,0001,210 yards as referenced to the center of the mooring tower, and the economic impacts are estimated for this zone. Given that the success of lobster fishing depends on numerous variables over the course of a year, the economic impact estimates are set up in the form of a sensitivity analysis.

### **2.2.1 Method**

The method used to estimate economic impacts is based on using the lobster pot density information contained within Resource Report No. 8, Land Use, Recreation and Aesthetics, Figure 8-8, which like all Broadwater Resource Reports, is incorporated by reference into this ~~CZCDCZCC~~ and its appendices. This information, obtained from the Connecticut Department of Environmental Protection (CTDEP) shows the density of lobster pot trawls observed in feet apart. The relevant Project safety and security zone area corresponds to a high density area characterized by pot trawls observed at 500 feet or less intervals. The spacing of the trawls, together with local Eastern LIS industry information on average pots per trawl, pounds per pot, and unit values (\$/lb), were used to estimate the value of lobster landings corresponding to this area. Area calculations were used to estimate how many trawls would most likely be characteristic of the densities observed from the CTDEP information.

### **2.2.2 Assumptions and Parameters**

The following data and assumptions were used to estimate the value of lobster landings that would correspond to the recommended safety and security zone area related to the FSRU during the period from 2010 to 2040. This period corresponds to both the construction phase and the operational lifetime of the Project. The assumptions and parameters used are provided in Table F-2-4 and explained in detail below for each row.

Table F-2-4 shows all of the assumptions and parameters used in the estimate of the direct economic impacts. Direct economic impacts are defined as the annual value of lobster landings that would correspond to the safety and security zone area.

- Row 1 shows the linear distance in yards from the ~~radius of the FSRU circular area.~~ Row 2 shows the distance in feet from the center of the mooring tower. Row 2 used to calculate the ~~area~~edge of the safety and security zone circular ~~zone~~area.
- Row ~~3~~2 shows the area calculation in square feet for the safety and security zone.
- Row ~~4~~3 shows the area calculation for the total area that would most likely contain a lobster trawl. Since trawls were observed at 500 ft. intervals, it was assumed that the center of the mini circle or the nucleus would represent a trawl buoy.
- Row ~~5~~4 shows the calculation that estimates the number of trawl lines contained within the circular zone. The calculation yields the number of trawls that could possibly fit within the circular safety and security zone. The calculation assumes that the spacing would be at equal intervals for order of magnitude estimation purposes.
- Row ~~6~~5 shows the estimated number of traps or lobster pots per trawl. This information was provided by NYSDEC. The number of lobster traps or pots per trawl can vary between 5 and 20 in part based on the season. The direct economic impacts are measured using this entire range to bracket the possible impacts in a sensitivity analysis.
- Row ~~7~~6 shows the estimated number of impacted traps (pots) that is the product of the number of trawls times the average number of pots per trawl.
- Row ~~8~~7 shows the most recent calculation for the average pounds per pot from the lobster catch effort time series for the Eastern Area of LIS, (ELIS). The ELIS contains the project area footprint within its borders and so was considered a reasonable estimate average number of pounds per pot.
- Row ~~9~~8 is an estimate of the total pounds or landings that would be foregone in a year because of the safety and security zone. Row ~~9~~8 is equal to the product of the average pounds per trap (Row ~~8~~7) times the estimated number of traps (Row ~~7~~6).
- Row ~~10~~9 shows a recent average price per pound (unit price) for American Lobster caught in NYS that was sourced from the NYS NOAA fisheries statistics. The time series for this unit price is shown in Figure 2-3 above. The trend line for the unit price per pound was projected forward and used to project unit prices for lobster in future project years.

- Row ~~11~~10 shows the estimated annual value of lobster landings and was calculated as the product of the estimated number of total pounds (Row ~~98~~9) times the unit price per pound (~~row 10~~Row 9).
- Row ~~12~~11 shows the discount rate used to discount the annual future year values of lost landings over the life of the Project (2010-2040). The future annual values are discounted to present value and summed. The 5% discount rate was used in other resource report calculations for consistency purposes and represents a rate used to discount natural resource streams and benefits. Discounting is used to take into account the time value of money.
- Row ~~13~~12 shows the cumulative present value sum of all future year lobster landings over the life of the Project (2010-2040). The calculations used to measure the cumulative present value are shown in Table F-2-5 below.
- Row ~~14~~13 shows the average annual equivalent value for the lobster landings. This value takes into account the cumulative present value over the life of the Project and is a measure of the average annual value taking into account price escalation and the time value of money. The value was calculated using the capital recovery factor.

**Table F-2-4 Assumptions and Parameters Used in Estimating of Direct Economic Impacts**

Row ( ) Formula	Assumption/Parameter	Safety & Security Landings Inputs
(1)	Approximate distance from center of mooring tower, yards	1,000 <u>1,210</u>
(2) = (1) x 3	Actual distance from mooring tower, feet	2,870
(32) = $\pi (2)^2$	Estimated circular area of safety & security zone in sq. ft.	25,872,476 <u>41,369,585</u>
(43) = $\pi (500 \text{ ft.})^2$	Line spacing sq. ft. (high density, area unit = 500 ft. apart)	785,398
(54) = (32) / (43)	Estimated impacted lines	33 <u>53</u>
(65)	Lobster pots/traps per trap line \b	15
(76) = (54) x (65)	Estimated Impacted traps	494 <u>790</u>
(87)	Average pounds per trap for ELIS \c	7.02 <u>7.0</u>
(98) = (76) x (87)	Estimated impacted pounds	3,467 <u>5,544</u>
(109)	2004 unit price (\$/lb)	\$3.74
(110) = (98) x (109)	2004 Est. annual value of landings	\$12,953 <u>20,712</u>
(121)	Discount rate	5%
(1312)	Cumulative present value sum of landings (2010-2040)	\$244,325 <u>390,671</u>
(1413)	Average annual equivalent value of landings	\$15,088 <u>24,126</u>

Notes:

\a reflects feet apart, High Densities, Source: Figure Resource Report No. 8, Figure 8-8, CT DEP, 2004

\b Estimate from Kim McKown, NYSDEC (2/3/06), can be up to 5-20 traps per trap line

\c reflects recent catch effort data for 2003 from NYSDEC for Eastern LIS area

\d NOAA Fisheries

Table F-2-5 shows the detailed calculations used in estimating the direct economic impacts attributable to the **recommended** safety and security zone over the life of the Project. The summary values correspond to those shown in Table F-2-4 above. Table F-2-4 is based on the catch effort value of 7 pounds of lobster per pot within the ELIS as a mostly likely average value for this variable.



**Table F-2-5 Direct Economic Impacts – Lobster Landings Worksheet Using Escalated Unit Price**

				Estimated Value at Projected Unit Prices	Discount RateFactor $r, i = 5\%$	DiscountDis counted Annual Values	
	Year	Estimated Pounds	Projected Unit Price	1,000	5.0%	1,000	
0	2006	0		0	1.000	0	
1	2007	0		0	0.952	0	
2	2008	0		0	0.907	0	
3	2009	0		0	0.864	0	
				\$15,322		\$12,605	
4	2010	<u>3,4675,544</u>	\$4.42	<u>24,499</u>	0.823	<u>20,156</u>	
				\$15,572		\$12,201	
1	5	2011	<u>3,4675,544</u>	\$4.49	<u>24,900</u>	0.784	<u>19,510</u>
				\$15,823		\$11,807	
2	6	2012	<u>3,4675,544</u>	\$4.56	<u>25,301</u>	0.746	<u>18,880</u>
				\$16,074		\$11,423	
3	7	2013	<u>3,4675,544</u>	\$4.64	<u>25,702</u>	0.711	<u>18,266</u>
				\$16,324		\$11,049	
4	8	2014	<u>3,4675,544</u>	\$4.71	<u>26,103</u>	0.677	<u>17,667</u>
				\$16,575		\$10,684	
5	9	2015	<u>3,4675,544</u>	\$4.78	<u>26,503</u>	0.645	<u>17,084</u>
				\$16,826		\$10,330	
6	10	2016	<u>3,4675,544</u>	\$4.85	<u>26,904</u>	0.614	<u>16,517</u>
				\$17,077		\$9,984	
7	11	2017	<u>3,4675,544</u>	\$4.93	<u>27,305</u>	0.585	<u>15,965</u>
				\$17,327		\$9,648	
8	12	2018	<u>3,4675,544</u>	\$5.00	<u>27,706</u>	0.557	<u>15,428</u>
				\$17,578		\$9,322	
9	13	2019	<u>3,4675,544</u>	\$5.07	<u>28,107</u>	0.530	<u>14,906</u>
				\$17,829		\$9,005	
10	14	2020	<u>3,4675,544</u>	\$5.14	<u>28,507</u>	0.505	<u>14,398</u>
				\$18,079		\$8,696	
11	15	2021	<u>3,4675,544</u>	\$5.21	<u>28,908</u>	0.481	<u>13,905</u>
				\$18,330		\$8,397	
12	16	2022	<u>3,4675,544</u>	\$5.29	<u>29,309</u>	0.458	<u>13,427</u>
				\$18,581		\$8,107	
13	17	2023	<u>3,4675,544</u>	\$5.36	<u>29,710</u>	0.436	<u>12,962</u>
				\$18,831		\$7,825	
14	18	2024	<u>3,4675,544</u>	\$5.43	<u>30,111</u>	0.416	<u>12,512</u>
				\$19,082		\$7,551	
15	19	2025	<u>3,4675,544</u>	\$5.50	<u>30,512</u>	0.396	<u>12,074</u>
				\$19,333		\$7,286	
16	20	2026	<u>3,4675,544</u>	\$5.58	<u>30,912</u>	0.377	<u>11,651</u>
				\$19,583		\$7,029	
17	21	2027	<u>3,4675,544</u>	\$5.65	<u>31,313</u>	0.359	<u>11,240</u>
				\$19,834		\$6,780	
18	22	2028	<u>3,4675,544</u>	\$5.72	<u>31,714</u>	0.342	<u>10,841</u>
				\$20,085		\$6,539	
19	23	2029	<u>3,4675,544</u>	\$5.79	<u>32,115</u>	0.326	<u>10,456</u>
				\$20,335		\$6,305	
20	24	2030	<u>3,4675,544</u>	\$5.87	<u>32,516</u>	0.310	<u>10,082</u>

21	25	2031	<u>3,467,544</u>	\$5.94	<u>\$20,586</u> <u>32,917</u>	0.295	<u>\$6,079</u> <u>9,720</u>
22	26	2032	<u>3,467,544</u>	\$6.01	<u>\$20,837</u> <u>33,317</u>	0.281	<u>\$5,860</u> <u>9,370</u>
23	27	2033	<u>3,467,544</u>	\$6.08	<u>\$21,087</u> <u>33,718</u>	0.268	<u>\$5,648</u> <u>9,031</u>
24	28	2034	<u>3,467,544</u>	\$6.15	<u>\$21,338</u> <u>34,119</u>	0.255	<u>\$5,443</u> <u>8,704</u>
25	29	2035	<u>3,467,544</u>	\$6.23	<u>\$21,589</u> <u>34,520</u>	0.243	<u>\$5,245</u> <u>8,386</u>
26	30	2036	<u>3,467,544</u>	\$6.30	<u>\$21,839</u> <u>34,921</u>	0.231	<u>\$5,053</u> <u>8,080</u>
27	31	2037	<u>3,467,544</u>	\$6.37	<u>\$22,090</u> <u>35,322</u>	0.220	<u>\$4,868</u> <u>7,783</u>
28	32	2038	<u>3,467,544</u>	\$6.44	<u>\$22,341</u> <u>35,722</u>	0.210	<u>\$4,689</u> <u>7,497</u>
29	33	2039	<u>3,467,544</u>	\$6.52	<u>\$22,591</u> <u>36,123</u>	0.200	<u>\$4,515</u> <u>7,220</u>
30	34	2040	<u>3,467,544</u>	\$6.59	<u>\$22,842</u> <u>36,529</u>	0.190	<u>\$4,348</u> <u>6,953</u>
							<u>\$244,325,390.6</u>
Cumulative present value sum (all years):							<u>71</u>
Average annual equivalent landings:							<u>\$15,088,24,126</u>

### Direct Economic Impacts

Table F-2-5 shows the future annual landings for the recommended safety and security zone.

#### 2.2.3 Sensitivity Analysis

Several additional economic impact estimates are provided and shown in a sensitivity analysis. These direct economic impact estimates are based on changing one of the key variables displayed in Table F-2-3. Since there is uncertainty concerning the range of values that key variables can take on, estimating a range of impacts to examine how each variable can potentially influence the scale of impacts is appropriate. The sensitivity analysis can also be used to address questions concerning the effect of assumptions and the most likely range of values that can reasonably be expected.



Figure 2-10 shows the results of changing the assumption used for the number of lobster pots per trawl. The base case economic impact estimate is based on using an average figure of 15 pots per trawl. Table F-2-6 shows the data used in the figure.

**Table F-2-6 Direct Economic Impacts-Summary of Sensitivity Analysis Based on Range of Lobster Pots per Trap Line**

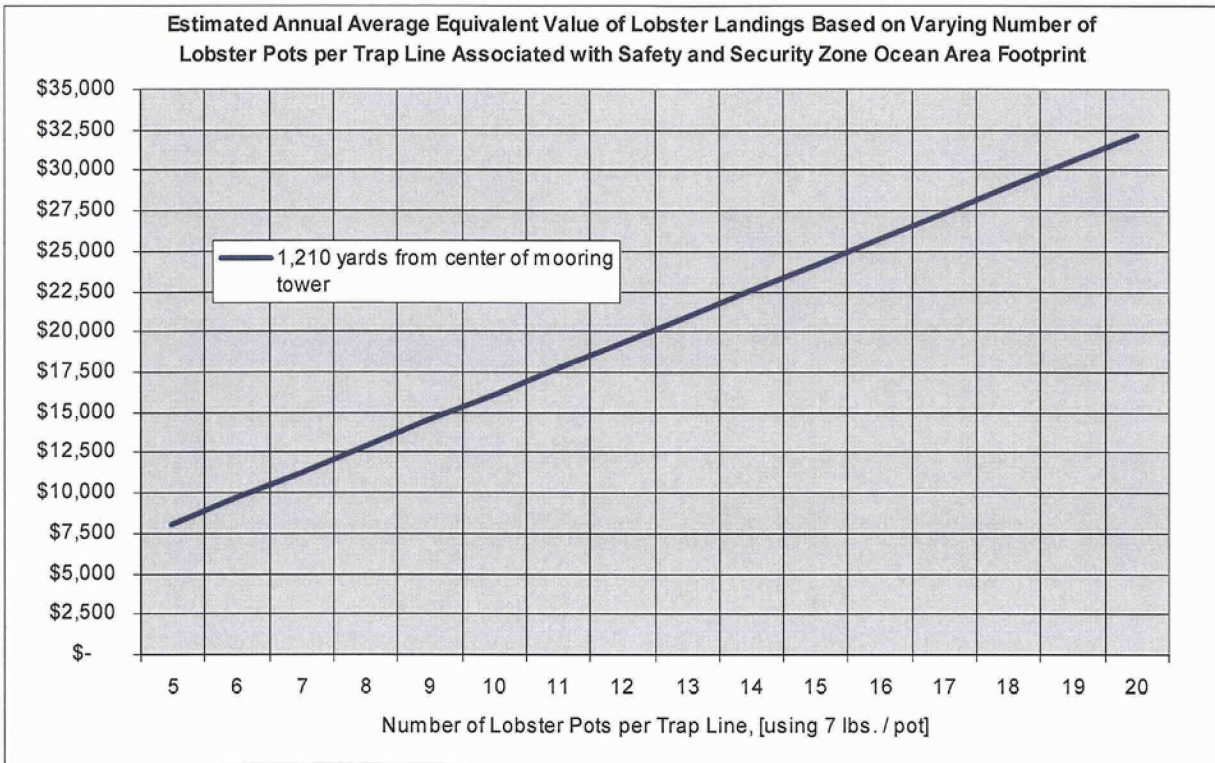
Pots Per Trawl	Direct Economic Impact
<b>Value of Average Annual Landings (2010-2040)</b>	
5	
10	\$10,050
15	\$15,080
20	\$20,110
<b>Cumulative Present Value of Future Annual Landings (2010-2040)</b>	
5	\$81,442
10	\$162,883
15	\$244,325
20	\$325,766

A restricted access area with a ~~1,000~~**1,210** yard radius from the mooring tower would correspond to annual lobster landings valued at between ~~\$5,000~~**8,000** and ~~\$20,000~~**32,000** per year depending on the number of pots attached to a trawl. For the base case assumption of 15 pots per trawl, the annual value of landings would correspond to ~~\$15,000~~**24,000**.

#### **2.2.4 Relative Size of Economic Impacts – Recommended Safety and Security Zone Ocean Area Compared to Larger Fishing Areas**

To assess the relative size of the revenues that would theoretically not be captured by area fishermen, the data in Table F-2-6 was compared to recent estimates of the total value of lobster landings for the Eastern LIS region, the entire LIS and NYS. It is possible that some lobstermen may be able to fish in adjacent waters enabling them to maintain their historic catch yields and incomes. However, local industry practices and protocols could make this form of de facto mitigation difficult to achieve. Table F-2-7 shows the results of the relative impact comparisons.





**Figure 2-10 Sensitivity Analyses: Estimated Annual ~~Values~~ Average Equivalent Value of Lobster Landings Based on Varying Number of Lobster Pots per Trawl for Ocean Areas Equivalent to the Broadwater Project Safety and Security Zone**

**Table F-2-7 Estimated Value of Lobster Landings Corresponding to  
Recommended Safety and Security Zone**

Lobster Fishing Area	1	2	3
	Pounds	Value	Value as Percent of Total NYS
<b>Ocean Area Alternatives Compared to Regional Lobster Landings* (2003)</b>			
Eastern LIS	383,297	\$1,792,589	22.5%
Total LIS	1,395,628	\$6,527,019	81.9%
Total NYS	1,703,692	\$7,967,761	100.0%
<b>1,0001,210 yds</b>			
<b>Safety and Security Zone Ocean Area as a Percent of Total Lobster Landings by Area</b>			
Eastern LIS	0.81.3%		
Total LIS	0.20.4%		
Total NYS	0.20.3%		

Source: NYSDEC, NOAA NMFS.

Note:

\* Value of lobster landings for ELIS, LIS, and NYS were estimated from landings in pounds data provided from NYS DEC and unit prices (\$/lb) from NOAA NMFS for NYS as a whole.

The top portion of Table F-2-7 shows the pounds caught from the NYSDEC data set, while the value column represents the product of pounds caught and an average unit price (\$/lb) sourced for NYS from NMFS statewide catch data. Column (3) shows each fishing area's value as a percent of the total NYS value of lobster landings. The bottom portion of Table F-2-7 shows the value of lobster landings corresponding to the recommended safety and security zone area as a percent of the larger region's lobster landings. The average annual value of landings for the 1,000recommended 1,210 yard safety and security zone would account for 0.81.3% of the total value of Eastern LIS 2003 landings, and 0.20.3% of total NYS landings.

## 2.3 Estimated Indirect and Total Economic Impacts

This section uses the estimated average annual value of lobster landings over the life of the Project to estimate the total economic impact contribution to NYS from this industry.

### 2.3.1 The IMPLAN Economic Input-Output Model

This section uses a widely employed economic input-output model called (IMPLAN) to estimate the total economic impacts to NYS produced by the lobster landings associated with the safety and security zone area. Total economic impacts take into account the indirect and induced impacts generated from the direct economic impacts or value of lobster

landings. Revenues from lobster landings are spent by fishermen on supplies, equipment, boat repairs, fuel, insurance and other items required to sustain commercial operations.

These direct expenditures have an indirect economic impact or stimulus on the suppliers and firms that are the recipients of these subsequent rounds of spending. In addition, employees and households that earn wages from these industries are also impacted by these expenditures and they in turn spend a portion of their incomes in NYS. These latter impacts are called induced effects. The direct, indirect and induced impacts are summed and are called total economic impacts. The indirect and induced impacts represent the multiplier or ripple effects that are generated from the initial direct expenditures from the lobster landings revenues. The IMPLAN model can be used to predict the future total annual economic impacts based on an economic structure for NYS that reflects the fishing industry's linkage to other interdependent industries and institutions such as households and state and local governments (see IMPLAN Box below).

### **2.3.2 Estimated Total Economic Impacts-Average Year and Long-Term**

Economic impacts can be described by several indicators. The broadest measure of impact is called total industry output, which is equal to the value of total industry production. Economic impacts are also measured by employee earnings, value added in production and employment. Value added in production represents the sum of employee compensation, proprietor income, other property income and indirect business taxes.

#### **What is IMPLAN (Impact Analysis for Planning?)**

IMPLAN is an analytical software tool used to estimate socioeconomic impacts originally developed by researchers at the U.S. Forest Service. The model is now owned and administered by Minnesota IMPLAN Group, Inc. (MIG 2000). The IMPLAN software is an input-output based model that describes the inter-industry relationships between industries and commodity purchases within a local economy. The model relies on county and state level data sets that are continually updated by the U.S. government and by MIG, Inc. IMPLAN is used to measure the multiplier effects or total economic impacts associated with a given project's or activity's spending relationships or linkages to a region's vendors, suppliers, households, and government entities. A multiplier describes the response of the regional economy to a stimulus (e.g., annual spending associated with commercial operations) that is a change in final demand. The multiplier process represents the predictive part of the model. The model augments the traditional input-output framework with a social accounting matrix that takes into account non-industrial transactions such as the payment of taxes by businesses and households. The model can therefore also be used to conduct a fiscal impact analysis.



The economic impacts associated with the potential loss of lobster revenues for the ~~estimated~~**recommended** safety and security zone were estimated for an average year and also over the long-term 30 year operational life of the Project. The long-term impacts were estimated for each year over the life of the Project and also expressed as a cumulative present value sum. The cumulative present value sum is a measure of the total long-term impact in present worth terms. Table F-2-8 summarizes the estimated economic impacts. Table F-2-8 shows the annual total industry output, the broadest measure of total economic impacts for an average year and the cumulative present worth measured over the 30 year economic life of the Project. Tables F-2-9 through F-2-12 show the worksheet used to measure total economic outputs for each measure, over the Project's operational lifetime to NYS. Tables F-2-10 through F-2-12 show the long-term economic impact estimates by each year for each measure. Tables F-2-12 and F-2-13 show the associated federal and state and local tax revenues that would be associated with the economic activity corresponding to the area.

<b>Table F-2-8 Summary of Economic Impacts to NYS Associated with Ocean Area Sizes Equivalent to the FSRU Safety and Security Zone-Average Year and Long-Term Cumulative Impacts</b>		
	<b>Average Annual Impacts</b>	<b>Cumulative Impacts (2010 – 2040)</b>
<b>Total Industry Output</b>		
Direct	\$15,088 <u>24,126</u>	\$190,817 <u>324,969</u>
Indirect	\$5,837 <u>9,333</u>	\$73,819 <u>125,717</u>
Induced	\$9,197 <u>14,706</u>	\$116,315 <u>198,089</u>
Total	\$30,122 <u>48,166</u>	\$380,951 <u>648,775</u>
<b>Employee Compensation</b>		
Direct	\$3,493 <u>5,585</u>	\$44,175 <u>75,231</u>
Indirect	\$2,018 <u>3,227</u>	\$25,519 <u>43,460</u>
Induced	\$2,920 <u>4,669</u>	\$36,930 <u>62,894</u>
Total	\$8,431 <u>13,481</u>	\$106,624 <u>181,585</u>
<b>Total Value Added</b>		
Direct	\$9,389 <u>15,013</u>	\$118,742 <u>202,222</u>
Indirect	\$3,368 <u>5,386</u>	\$42,599 <u>72,547</u>
Induced	\$5,923 <u>9,471</u>	\$74,907 <u>127,570</u>
Total	\$18,680 <u>29,870</u>	\$236,248 <u>402,340</u>
<b>Employment</b>		
Direct	0.8 <u>1.3</u>	25 <u>40</u>
Indirect	0.0 <u>0.1</u>	1 <u>2</u>
Induced	0.1	2 <u>4</u>
Total	1.0 <u>1.5</u>	29 <u>46</u>

**Table F-2-9 Total Industry Output to NYS Associated with Ocean Area Equivalent in Size to the Recommended Safety and Security Zone**

		Year	Direct	Indirect	Induced	Total	Discount Rate = 5.0%	Discounted Annual Values			
								Direct	Indirect	Induced	Total
	0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -
	1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -
	2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -
	3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -
1	4	2010	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.823	\$ 19,849	\$ 7,679	\$ 12,099	\$ 39,626
2	5	2011	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.784	\$ 18,903	\$ 7,313	\$ 11,523	\$ 37,739
3	6	2012	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.746	\$ 18,003	\$ 6,965	\$ 10,974	\$ 35,942
4	7	2013	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.711	\$ 17,146	\$ 6,633	\$ 10,451	\$ 34,230
5	8	2014	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.677	\$ 16,329	\$ 6,317	\$ 9,954	\$ 32,600
6	9	2015	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.645	\$ 15,552	\$ 6,016	\$ 9,480	\$ 31,048
7	10	2016	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.614	\$ 14,811	\$ 5,730	\$ 9,028	\$ 29,570
8	11	2017	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.585	\$ 14,106	\$ 5,457	\$ 8,598	\$ 28,161
9	12	2018	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.557	\$ 13,434	\$ 5,197	\$ 8,189	\$ 26,820
10	13	2019	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.530	\$ 12,795	\$ 4,950	\$ 7,799	\$ 25,543
11	14	2020	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.505	\$ 12,185	\$ 4,714	\$ 7,428	\$ 24,327
12	15	2021	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.481	\$ 11,605	\$ 4,489	\$ 7,074	\$ 23,168
13	16	2022	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.458	\$ 11,052	\$ 4,276	\$ 6,737	\$ 22,065
14	17	2023	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.436	\$ 10,526	\$ 4,072	\$ 6,416	\$ 21,015
15	18	2024	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.416	\$ 10,025	\$ 3,878	\$ 6,111	\$ 20,014
16	19	2025	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.396	\$ 9,547	\$ 3,694	\$ 5,820	\$ 19,061
17	20	2026	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.377	\$ 9,093	\$ 3,518	\$ 5,543	\$ 18,153
18	21	2027	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.359	\$ 8,660	\$ 3,350	\$ 5,279	\$ 17,289
19	22	2028	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.342	\$ 8,247	\$ 3,191	\$ 5,027	\$ 16,465
20	23	2029	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.326	\$ 7,855	\$ 3,039	\$ 4,788	\$ 15,681
21	24	2030	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.310	\$ 7,481	\$ 2,894	\$ 4,560	\$ 14,935
22	25	2031	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.295	\$ 7,124	\$ 2,756	\$ 4,343	\$ 14,223
23	26	2032	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.281	\$ 6,785	\$ 2,625	\$ 4,136	\$ 13,546
24	27	2033	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.268	\$ 6,462	\$ 2,500	\$ 3,939	\$ 12,901
25	28	2034	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.255	\$ 6,154	\$ 2,381	\$ 3,751	\$ 12,287
26	29	2035	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.243	\$ 5,861	\$ 2,267	\$ 3,573	\$ 11,702
27	30	2036	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.231	\$ 5,582	\$ 2,160	\$ 3,403	\$ 11,144
28	31	2037	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.220	\$ 5,316	\$ 2,057	\$ 3,241	\$ 10,614
29	32	2038	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.210	\$ 5,063	\$ 1,959	\$ 3,086	\$ 10,108
30	33	2039	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.200	\$ 4,822	\$ 1,865	\$ 2,939	\$ 9,627
31	34	2040	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.190	\$ 4,593	\$ 1,777	\$ 2,799	\$ 9,169
Cumulative present value sum (all years)								\$ 324,969	\$ 125,717	\$ 198,089	\$ 648,775

**Table F- 2-10 Employee Compensation Associated with Ocean Areas Equivalent in Size to the Recommended Safety and Security Zone**

							Discount Rate = 5.0%	Discounted Annual Values			
Year			Direct	Indirect	Induced	Total		Direct	Indirect	Induced	Total
	0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -
	1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -
	2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -
	3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -
1	4	2010	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.823	\$ 4,595	\$ 2,654	\$ 3,841	\$ 11,091
2	5	2011	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.784	\$ 4,376	\$ 2,528	\$ 3,658	\$ 10,563
3	6	2012	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.746	\$ 4,168	\$ 2,408	\$ 3,484	\$ 10,060
4	7	2013	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.711	\$ 3,969	\$ 2,293	\$ 3,318	\$ 9,581
5	8	2014	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.677	\$ 3,780	\$ 2,184	\$ 3,160	\$ 9,124
6	9	2015	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.645	\$ 3,600	\$ 2,080	\$ 3,010	\$ 8,690
7	10	2016	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.614	\$ 3,429	\$ 1,981	\$ 2,867	\$ 8,276
8	11	2017	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.585	\$ 3,266	\$ 1,886	\$ 2,730	\$ 7,882
9	12	2018	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.557	\$ 3,110	\$ 1,797	\$ 2,600	\$ 7,507
10	13	2019	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.530	\$ 2,962	\$ 1,711	\$ 2,476	\$ 7,149
11	14	2020	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.505	\$ 2,821	\$ 1,630	\$ 2,358	\$ 6,809
12	15	2021	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.481	\$ 2,687	\$ 1,552	\$ 2,246	\$ 6,485
13	16	2022	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.458	\$ 2,559	\$ 1,478	\$ 2,139	\$ 6,176
14	17	2023	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.436	\$ 2,437	\$ 1,408	\$ 2,037	\$ 5,882
15	18	2024	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.416	\$ 2,321	\$ 1,341	\$ 1,940	\$ 5,602
16	19	2025	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.396	\$ 2,210	\$ 1,277	\$ 1,848	\$ 5,335
17	20	2026	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.377	\$ 2,105	\$ 1,216	\$ 1,760	\$ 5,081
18	21	2027	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.359	\$ 2,005	\$ 1,158	\$ 1,676	\$ 4,839
19	22	2028	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.342	\$ 1,909	\$ 1,103	\$ 1,596	\$ 4,608
20	23	2029	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.326	\$ 1,818	\$ 1,050	\$ 1,520	\$ 4,389
21	24	2030	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.310	\$ 1,732	\$ 1,000	\$ 1,448	\$ 4,180
22	25	2031	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.295	\$ 1,649	\$ 953	\$ 1,379	\$ 3,981
23	26	2032	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.281	\$ 1,571	\$ 907	\$ 1,313	\$ 3,791
24	27	2033	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.268	\$ 1,496	\$ 864	\$ 1,251	\$ 3,611
25	28	2034	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.255	\$ 1,425	\$ 823	\$ 1,191	\$ 3,439
26	29	2035	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.243	\$ 1,357	\$ 784	\$ 1,134	\$ 3,275
27	30	2036	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.231	\$ 1,292	\$ 747	\$ 1,080	\$ 3,119
28	31	2037	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.220	\$ 1,231	\$ 711	\$ 1,029	\$ 2,971
29	32	2038	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.210	\$ 1,172	\$ 677	\$ 980	\$ 2,829
30	33	2039	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.200	\$ 1,116	\$ 645	\$ 933	\$ 2,694
31	34	2040	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.190	\$ 1,063	\$ 614	\$ 889	\$ 2,566
Cumulative present value sum (all years)								\$ 75,231	\$ 43,460	\$ 62,894	\$ 181,585

**Table F-2-11 Total Value Added Associated with Ocean Areas Equivalent in Size to the Recommended Safety and Security Zone**

		Year					Discount Rate = 5.0%	Discounted Annual Values			
			Direct	Indirect	Induced	Total		Direct	Indirect	Induced	Total
	0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -
	1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -
	2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -
	3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -
1	4	2010	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.823	\$ 12,351	\$ 4,431	\$ 7,792	\$ 24,574
2	5	2011	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.784	\$ 11,763	\$ 4,220	\$ 7,421	\$ 23,404
3	6	2012	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.746	\$ 11,203	\$ 4,019	\$ 7,067	\$ 22,290
4	7	2013	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.711	\$ 10,670	\$ 3,828	\$ 6,731	\$ 21,228
5	8	2014	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.677	\$ 10,162	\$ 3,645	\$ 6,410	\$ 20,217
6	9	2015	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.645	\$ 9,678	\$ 3,472	\$ 6,105	\$ 19,255
7	10	2016	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.614	\$ 9,217	\$ 3,307	\$ 5,814	\$ 18,338
8	11	2017	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.585	\$ 8,778	\$ 3,149	\$ 5,537	\$ 17,464
9	12	2018	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.557	\$ 8,360	\$ 2,999	\$ 5,274	\$ 16,633
10	13	2019	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.530	\$ 7,962	\$ 2,856	\$ 5,023	\$ 15,841
11	14	2020	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.505	\$ 7,583	\$ 2,720	\$ 4,783	\$ 15,086
12	15	2021	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.481	\$ 7,222	\$ 2,591	\$ 4,556	\$ 14,368
13	16	2022	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.458	\$ 6,878	\$ 2,467	\$ 4,339	\$ 13,684
14	17	2023	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.436	\$ 6,550	\$ 2,350	\$ 4,132	\$ 13,032
15	18	2024	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.416	\$ 6,238	\$ 2,238	\$ 3,935	\$ 12,412
16	19	2025	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.396	\$ 5,941	\$ 2,131	\$ 3,748	\$ 11,821
17	20	2026	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.377	\$ 5,658	\$ 2,030	\$ 3,570	\$ 11,258
18	21	2027	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.359	\$ 5,389	\$ 1,933	\$ 3,400	\$ 10,722
19	22	2028	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.342	\$ 5,132	\$ 1,841	\$ 3,238	\$ 10,211
20	23	2029	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.326	\$ 4,888	\$ 1,754	\$ 3,083	\$ 9,725
21	24	2030	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.310	\$ 4,655	\$ 1,670	\$ 2,937	\$ 9,262
22	25	2031	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.295	\$ 4,433	\$ 1,590	\$ 2,797	\$ 8,821
23	26	2032	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.281	\$ 4,222	\$ 1,515	\$ 2,664	\$ 8,401
24	27	2033	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.268	\$ 4,021	\$ 1,443	\$ 2,537	\$ 8,001
25	28	2034	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.255	\$ 3,830	\$ 1,374	\$ 2,416	\$ 7,620
26	29	2035	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.243	\$ 3,647	\$ 1,309	\$ 2,301	\$ 7,257
27	30	2036	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.231	\$ 3,474	\$ 1,246	\$ 2,191	\$ 6,911
28	31	2037	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.220	\$ 3,308	\$ 1,187	\$ 2,087	\$ 6,582
29	32	2038	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.210	\$ 3,151	\$ 1,130	\$ 1,988	\$ 6,269
30	33	2039	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.200	\$ 3,001	\$ 1,077	\$ 1,893	\$ 5,970
31	34	2040	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.190	\$ 2,858	\$ 1,025	\$ 1,803	\$ 5,686
Cumulative present value sum (all years)								\$ 202,222	\$ 72,547	\$ 127,570	\$ 402,340

**Table F-2-12 Tax Revenues Associated with Total Economic Activity for Ocean Areas Equivalent in Size to the Recommended Safety and Security Zone**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
Federal	\$1,591.00 <u>2,544.00</u>	\$20,119.00 <u>34,264.00</u>
State/Local	\$1,901.00 <u>3,041.00</u>	\$24,048.00 <u>40,955.00</u>
Total	\$3,492.00 <u>5,584.00</u>	\$44,167.00 <u>75,218.00</u>

**Table F-2-13 Tax Revenues by Year Associated with Ocean Area for the  
Estimated Recommended Safety and Security Zone**

			State/ Federal Local Total			Discount Rate = 5.0%	Discounted Annual Values		
Year			Federal	Local	Total		Federal	State/Local	Total
	0	2006	0	0	\$ -	1.000	\$ -	\$ -	\$ -
	1	2007	0	0	\$ -	0.952	\$ -	\$ -	\$ -
	2	2008	0	0	\$ -	0.907	\$ -	\$ -	\$ -
	3	2009	0	0	\$ -	0.864	\$ -	\$ -	\$ -
1	4	2010	\$ 2,544	\$ 3,041	\$ 5,584	0.823	\$ 2,093	\$ 2,501	\$ 4,594
2	5	2011	\$ 2,544	\$ 3,041	\$ 5,584	0.784	\$ 1,993	\$ 2,382	\$ 4,375
3	6	2012	\$ 2,544	\$ 3,041	\$ 5,584	0.746	\$ 1,898	\$ 2,269	\$ 4,167
4	7	2013	\$ 2,544	\$ 3,041	\$ 5,584	0.711	\$ 1,808	\$ 2,161	\$ 3,969
5	8	2014	\$ 2,544	\$ 3,041	\$ 5,584	0.677	\$ 1,722	\$ 2,058	\$ 3,780
6	9	2015	\$ 2,544	\$ 3,041	\$ 5,584	0.645	\$ 1,640	\$ 1,960	\$ 3,600
7	10	2016	\$ 2,544	\$ 3,041	\$ 5,584	0.614	\$ 1,562	\$ 1,867	\$ 3,428
8	11	2017	\$ 2,544	\$ 3,041	\$ 5,584	0.585	\$ 1,487	\$ 1,778	\$ 3,265
9	12	2018	\$ 2,544	\$ 3,041	\$ 5,584	0.557	\$ 1,416	\$ 1,693	\$ 3,110
10	13	2019	\$ 2,544	\$ 3,041	\$ 5,584	0.530	\$ 1,349	\$ 1,612	\$ 2,961
11	14	2020	\$ 2,544	\$ 3,041	\$ 5,584	0.505	\$ 1,285	\$ 1,536	\$ 2,820
12	15	2021	\$ 2,544	\$ 3,041	\$ 5,584	0.481	\$ 1,224	\$ 1,463	\$ 2,686
13	16	2022	\$ 2,544	\$ 3,041	\$ 5,584	0.458	\$ 1,165	\$ 1,393	\$ 2,558
14	17	2023	\$ 2,544	\$ 3,041	\$ 5,584	0.436	\$ 1,110	\$ 1,327	\$ 2,436
15	18	2024	\$ 2,544	\$ 3,041	\$ 5,584	0.416	\$ 1,057	\$ 1,263	\$ 2,320
16	19	2025	\$ 2,544	\$ 3,041	\$ 5,584	0.396	\$ 1,007	\$ 1,203	\$ 2,210
17	20	2026	\$ 2,544	\$ 3,041	\$ 5,584	0.377	\$ 959	\$ 1,146	\$ 2,105
18	21	2027	\$ 2,544	\$ 3,041	\$ 5,584	0.359	\$ 913	\$ 1,091	\$ 2,004
19	22	2028	\$ 2,544	\$ 3,041	\$ 5,584	0.342	\$ 870	\$ 1,039	\$ 1,909
20	23	2029	\$ 2,544	\$ 3,041	\$ 5,584	0.326	\$ 828	\$ 990	\$ 1,818
21	24	2030	\$ 2,544	\$ 3,041	\$ 5,584	0.310	\$ 789	\$ 943	\$ 1,732
22	25	2031	\$ 2,544	\$ 3,041	\$ 5,584	0.295	\$ 751	\$ 898	\$ 1,649
23	26	2032	\$ 2,544	\$ 3,041	\$ 5,584	0.281	\$ 715	\$ 855	\$ 1,571
24	27	2033	\$ 2,544	\$ 3,041	\$ 5,584	0.268	\$ 681	\$ 814	\$ 1,496
25	28	2034	\$ 2,544	\$ 3,041	\$ 5,584	0.255	\$ 649	\$ 776	\$ 1,425
26	29	2035	\$ 2,544	\$ 3,041	\$ 5,584	0.243	\$ 618	\$ 739	\$ 1,357
27	30	2036	\$ 2,544	\$ 3,041	\$ 5,584	0.231	\$ 589	\$ 704	\$ 1,292
28	31	2037	\$ 2,544	\$ 3,041	\$ 5,584	0.220	\$ 561	\$ 670	\$ 1,231
29	32	2038	\$ 2,544	\$ 3,041	\$ 5,584	0.210	\$ 534	\$ 638	\$ 1,172
30	33	2039	\$ 2,544	\$ 3,041	\$ 5,584	0.200	\$ 508	\$ 608	\$ 1,116
31	34	2040	\$ 2,544	\$ 3,041	\$ 5,584	0.190	\$ 484	\$ 579	\$ 1,063
Cumulative present value sum (all years)							\$ 34,264	\$ 40,955	\$ 75,218

### **3.0 COMMERCIAL FISHERIES**

This section assembles data and information on commercial fisheries landings to estimate the economic impacts to this industry from lost access attributable to the establishment of the safety and security zone surrounding the FSRU. The impacts are estimated over the 30 year life of the Project. The commercial fisheries landings data used to estimate the long-term economic impact to this industry was reported within the summary report prepared for the Broadwater Energy Fisherman Outreach Program (Resource Report No. 8, Appendix C, p. 10), annexed as Appendix H.

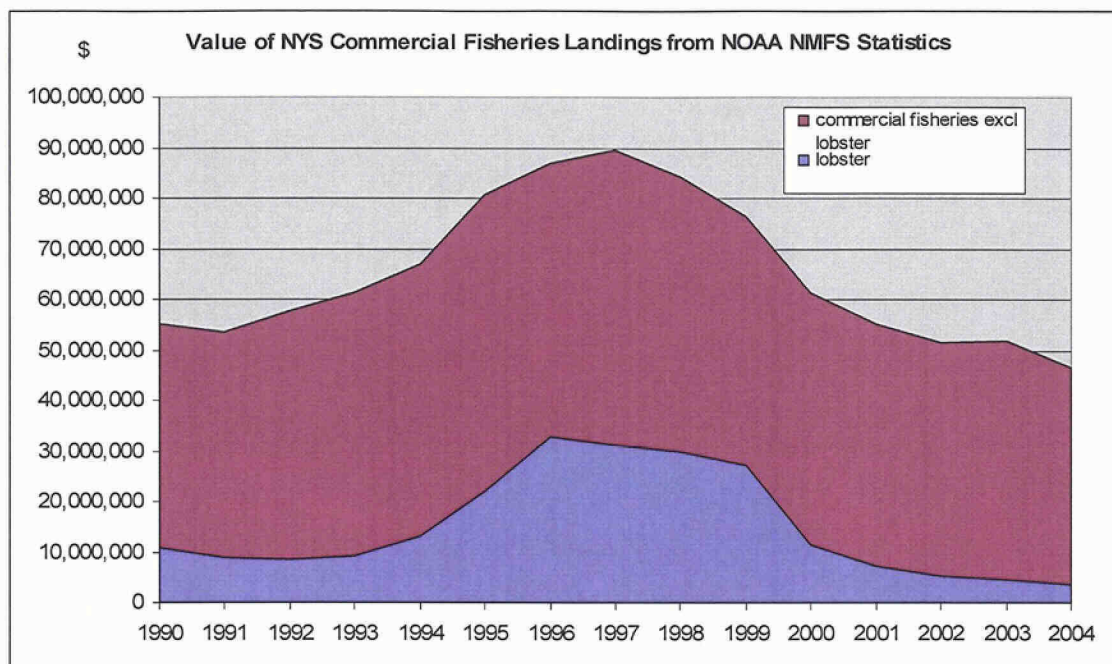
The landings and market value data obtained and analyzed were sourced from the NMFS. The data assembled reflect important trends that are considered and used in developing an impact estimate attributable to the loss of access to the safety and security zone for the proposed Project.

#### **3.1 Background Historical Market Context and Key Recent Trends**

Table F-2-1 above summarizes the economic contribution of the commercial finfish, shellfish and lobster industries to New York State. This table was reproduced from a table prepared by the Sea Grant Study. Table F-2-1 shows that in 1999, non-lobster commercial fisheries, comprised of combined finfish and shellfish, accounted for landings valued at \$50.9 million in that year, or 65% of the value of landings for all commercial fisheries. The total economic impact for this non-lobster industry segment was \$95.6 million out of a total \$149.6 million based on all commercial fishing industries, including lobster.

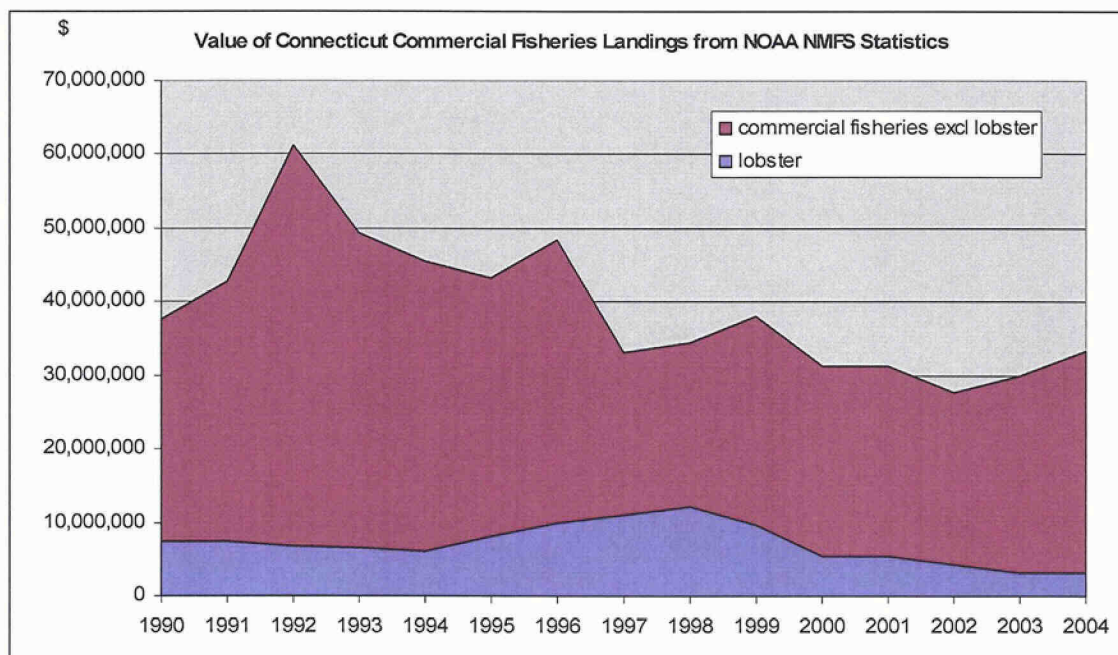
Since the Sea Grant economic impact study was completed, the total value of commercial finfish landings (including lobster) fell to \$46.4 million in 2004. Excluding lobster, the value of commercial fisheries declined from \$49.2 million in 1999 to \$42.6 million by 2004. The decline in the value of lobster landings has had the most impact on the combined value of the industry, measured by landings. Figure 3-1 shows the trends for New York State since 1990 in the value of landings organized by total commercial fisheries, and commercial fisheries excluding lobster, while Figure 3-2 shows the corresponding data for Connecticut.





Source: NOAA NMFS

**Figure 3-1 Value of NYS Commercial Fisheries Landings from NOAA NMFS Statistics**



Source: NOAA NMFS

**Figure 3-2 Value of Connecticut Commercial Fisheries Landings from NOAA NMFS Statistics**

### Relevant Commercial Landings, Pounds and Value

NMFS data on commercial landings in pounds was summarized in Table 1 of the Broadwater's Fishermen Outreach report, which is annexed as Appendix H. This data



corresponded to a large LIS area between coordinates bounded by the East End and the West End points of demarcation. Figure 3-3 reproduces the map for this area. The NMFS data was compiled for 2002 and 2003. There is no federal requirement for vessels fishing solely within the Sound to furnish trip reports to the NMFS. The data therefore should be considered as a portion of the total potential catch within LIS corresponding to these waters and is reflective of the species most likely landed in this area.

Table F-3-1 reproduces Table 1 from the Fishermen Outreach report and adds estimated values for the pounds caught. The values were estimated using unit values (\$/lb) obtained from NMFS annual reports for the states of NY and CT. The unit value estimates were obtained by averaging the values and pounds for the species shown for NYS and CT total landings for the corresponding years. The unit value averages used to estimate the total value of landings were weighted by the pounds for each species.

### **3.1.1 Estimation of Direct Economic Impact of Commercial Landings**

The following section describes the method, assumptions and procedures used to estimate the value of commercial fishery landings corresponding to the ocean areas that would not be accessible over the Project's 30 year lifetime. The future annual value of commercial fish landings (2010-2040) are defined as the direct economic impact. The impacts estimates are presented for an average year, and for a long-term time horizon spanning the life of the Project.

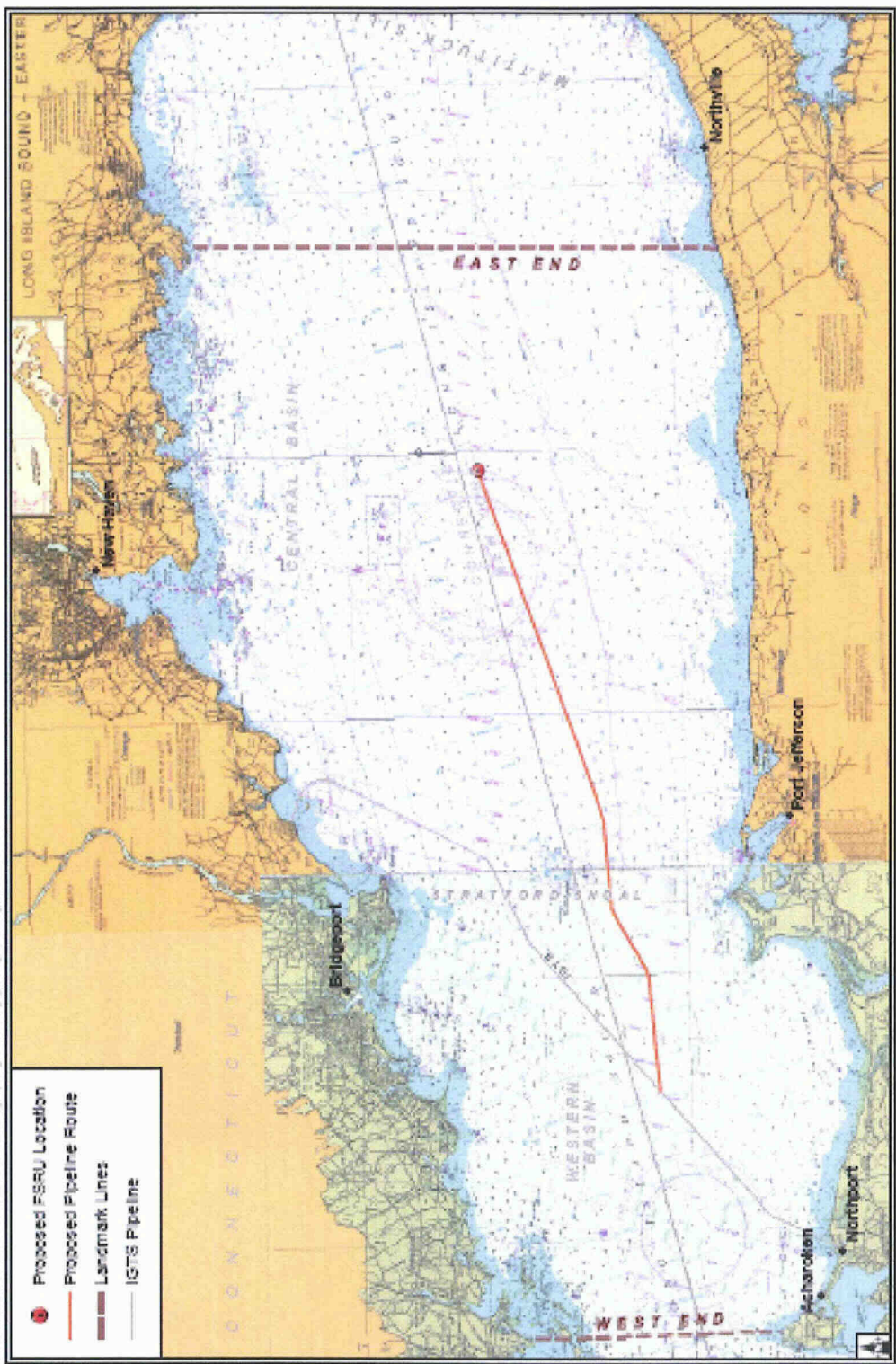
#### **3.1.1.1 Method & Assumptions**

The method used to estimate the value of commercial fisheries landings was based on using an extract of the commercial species NMFS landings data within the East End and West End large LIS area provided in the Fishermen Outreach report, which is annexed as Appendix H. The number of acres corresponding to the FSRU circular safety and security zone was compared to the ocean areas for all trawl areas corresponding to these catches. These ratios were used to scale or pro-rate the LIS NMFS landings and value data to estimate the value of landings associated with the smaller areas that would be non-accessible due to the estimated safety and security zone.

The annual value of landings corresponding to these species within the circular area was projected forward in time over the 30 year life of the Project to arrive at an estimate of

long-term impacts. No assumptions were made concerning species population growth or catch effort over this time period. The direct economic impacts or value of commercial fish landings represent order of magnitude estimates using available information.

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Source: U.S. Geological Survey, Open-File Report 06-354, 2006.  
U.S. NOAA Electronic Nautical Charts.

**Figure 2** Locations of Boundaries used for NOAA Landings Data

**Figure 3-3** Locations of LIS Boundaries Corresponding to NMFS Landings Data

**Table F- 3-1 Species, Total Live Pounds and Estimated Values for Fish Harvested in Long Island Sound Commercial Fisheries during the 2002 and 2003 Fishing Seasons as Provided by the National Oceanic and Atmospheric Administration**

Species	Live Pounds	Estimated Value \a
Angler	43,680	\$34,462
Scup	40,733	\$29,200
Bluefish	14,827	\$5,130
Flounder, Summer	12,513	\$24,744
Tautog	3,642	\$6,117
Butterfish	3,527	\$2,138
Squid (Loligo)	1,810	\$1,358
Skates	1,767	\$251
Sea Robbins	1,222	\$202
Sea Bass, Black	1,093	\$2,609
Flounder, Yellowtail	770	\$846
Flounder, Winter	572	\$648
Bass, Striped	272	\$681
Dogfish, Smooth	189	\$58
Hake, Red	92	\$37
Croaker, Atlantic	26	\$13
Eel, Conger	25	\$14
Bonito	12	\$18
Flounder, Sand-Dab	4	na
<b>Total:</b>	<b>126,776</b>	<b>\$108,527</b>

Source: National Oceanic and Atmospheric Administration, Broadwater Energy Fisherman Outreach, August 2005, p. 10, Table 1

Notes: \* All records are from Federal Permit numbers that possess a permit with a federal reporting requirement. \a the estimated values are based on an average annual unit value (\$/lb) that combines both New York and Connecticut catch information sourced from NMFS Annual Landings Summaries. The unit values were based on calculating the combined total value of catches (per each individual species) for each state and dividing by the combined total number of pounds. These unit values were then applied to the pounds shown in table to estimate the values for these species.

Since the NMFS landings data did not include any state landings estimates from fishermen who do not submit federal reports, the two years' worth of catch data was not prorated by year and the two year total was used as an estimate of the annual total catch for working purposes. This procedure acknowledges that the NMFS data represents a subset or portion of the total commercial fisheries activity within this relevant area.

In addition, no explicit assumptions were used concerning species population growth or catch effort.



### 3.1.2 Procedures

This section uses the above data on the commercial landings within the wide LIS area to estimate landings that are scaled to the size of the recommended safety and security zone area corresponding to the ~~estimated~~ safety and security zone footprint. Data was assembled on the total acreage corresponding to the area between the East End and West End lines displayed in Figure 3-3 above. The Project safety and security zone footprint (in acres) was compared to the total trawl areas in acres. The ratios from these comparisons were used to scale the NMFS commercial landings data provided in Table F-3-1. Table F-3-2 shows the results, while Figure 3-4 shows the trawl line areas.

**Table F-3-2 Comparison of LIS Trawl Areas and Project Fishing Areas in Acres**

Trawl Areas	Acres	
A	16,734.26	
B	2,582.32	
C	2,209.21	
<b>Total</b>	<b>21,525.79</b>	
<u>Recommended Security Zone</u>	<u>Acres in Trawl Area</u>	<u>Percent of Total Trawl Area</u>
1,0001,210 yds	248.34413.42	1.21.9%

The data in Table F-3-2 were used to scale the total landings data for the area based on the relative number of acres. The direct economic impact estimates were based on assuming that similar types of species would be landed at depths corresponding to the ~~projected~~recommended FSRU safety and security zone location.

Figure 3-4 below displayed the trawl areas and ~~proposed~~recommended safety and security zone area. Table F-3-3 shows the results of scaling the East End to West End Area landings using the trawl areas and the acres corresponding to the Project's footprint.

Table F-3-3 shows the results of the scaling calculations using the relative number of trawl area acres to estimate the value of fish landings. The table shows that applying this method, the recommended FSRU safety and security zone area would correspond to several thousand dollars worth of fish landings within an average year.

L:\Pensacola\NG\BROADWATER\Waps\WXD\100506R\Revised\Figures\1210yd\Buffer\mooring\_acreages.mxd 10/2006

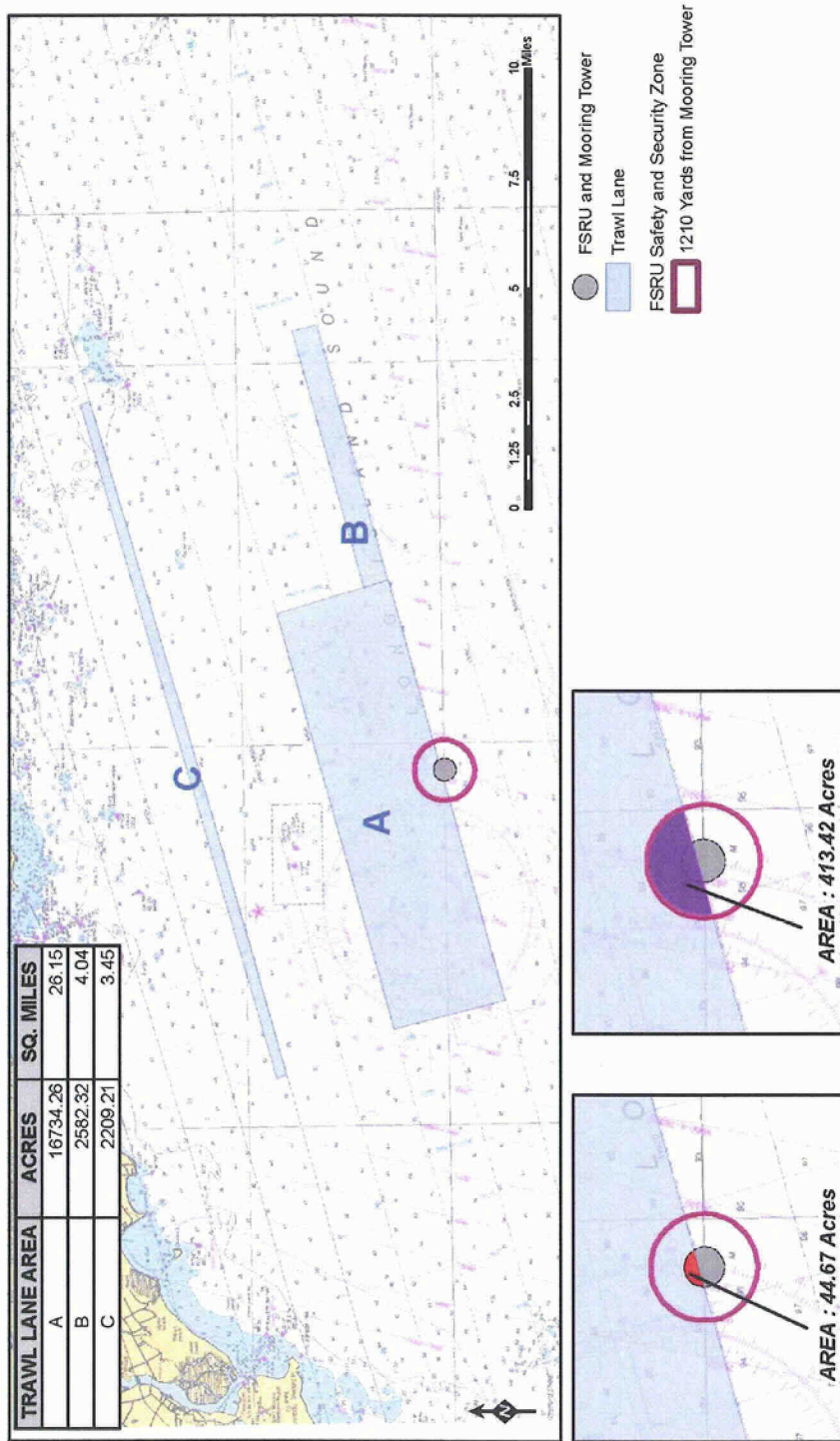


Figure 3-4 Area of Trawl Lanes Surrounding Mooring Towers

**Table F-3-3 Species, Total Live Pounds, and Estimated Value of Fish Harvested in Long Island Sound Commercial Fisheries during the 2002 and 2003 Fishing Seasons as Provided by NOAA and Estimated Values Corresponding to the Recommended Safety and Security Zone Area**

No.	Long Island Sound East to West End Ocean Area <sup>a</sup>		Landings in Pounds	Estimated Value of Landings
	Species	Pounds		
1	Angler	43,680	\$34,462	503.9 <del>838.91</del> \$354.50 <del>661.87</del>
2	Scup	40,733	\$29,200	469.9 <del>782.31</del> \$377.80 <del>5560.81</del>
3	Bluefish	14,827	\$5,130	171.1 <del>284.76</del> \$51.20 <del>598.53</del>
4	Flounder, Summer	12,513	\$24,744	144.4 <del>240.32</del> \$291.80 <del>5475.22</del>
5	Tautog	3,642	\$6,117	42.0 <del>69.95</del> \$85.20 <del>5117.48</del>
6	Butterfish	3,527	\$2,138	40.7 <del>67.74</del> \$25.50 <del>541.07</del>
7	Squid (Loligo)	1,810	\$1,358	20.9 <del>34.76</del> \$16.90 <del>526.08</del>
8	Skates	1,767	\$251	20.4 <del>33.94</del> \$2.80 <del>4.82</del>
9	Sea Robbins	1,222	\$202	14.1 <del>23.47</del> \$1.80 <del>3.89</del>
10	Sea Bass, Black	1,093	\$2,609	12.6 <del>20.99</del> \$30.00 <del>550.11</del>
11	Flounder, Yellowtail	770	\$846	8.9 <del>14.79</del> \$11.80 <del>516.25</del>
12	Flounder, Winter	572	\$648	6.6 <del>10.99</del> \$8.20 <del>512.44</del>
13	Bass, Striped	272	\$681	3.1 <del>5.22</del> \$7.40 <del>513.08</del>
14	Dogfish, Smooth	189	\$58	2.2 <del>3.63</del> \$0.60 <del>1.12</del>
15	Hake, Red	92	\$37	1.1 <del>1.77</del> \$0.50 <del>0.70</del>
16	Croaker, Atlantic	26	\$13	0.3 <del>0.50</del> \$0.20 <del>0.25</del>
17	Eel, Conger	25	\$14	0.3 <del>0.48</del> \$0.10 <del>0.27</del>
18	Bonito	12	\$18	0.1 <del>0.23</del> \$0.10 <del>0.35</del>
19	Flounder, Sand-Dab	4	na	0.0 <del>0.08</del> na
	<b>Total:</b>	<b>126,776</b>	<b>\$108,527</b>	<b>1,463.2 <del>2,434.83</del> \$1,267.2,084.34</b>

The annual value of dockside landings was used to project the total economic impacts corresponding to these areas shown below. Table F-3-4 shows the estimated direct economic impact by each year over the Project's 30 year life and the cumulative long-term economic impact. Since the impacts are expected to occur in future years, the annual and cumulative value of landings are expressed in present value terms using a 5% discount rate to acknowledge the time value of money.



**Table F-3-4 Estimated Direct Economic Impacts by Year for Commercial Fisheries = Commercial Fisheries Landings Worksheet Using Projected Unit Prices (\$/lb) Annual Value of Landings for the Estimated Recommended Safety and Security Zone (1,210 Yds)**

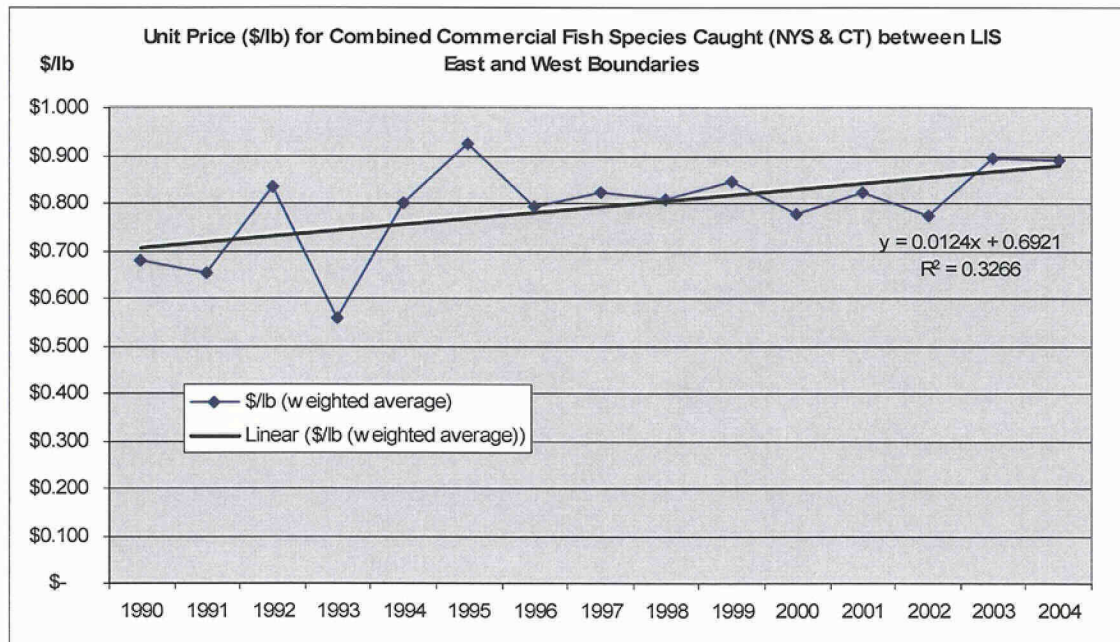
		Year	Estimated Pounds 1,000 <u>Corresponding</u> to 1,210 Yard Safety and Security Zone	Projected Price \$/lb	Estimated Value at Projected Unit Prices 1,000(1,210 Yards)	Discount Rate = 5.0%	<u>Annual</u> Discounted Values 1,000Value
	0	2006	0	\$0.903	0	1.000	0
	1	2007	0	\$0.915	0	0.952	0
	2	2008	0	\$0.928	0	0.907	0
	3	2009	0	\$0.940	0	0.864	0
	4	2010	<u>1,463-2,435</u>	\$0.953	<u>\$1,3932,319</u>	0.823	<u>\$ 1,1461,908</u>
1	5	2011	<u>1,463-2,435</u>	\$0.965	<u>\$1,4112,349</u>	0.784	<u>\$1,1061,841</u>
2	6	2012	<u>1,463-2,435</u>	\$0.977	<u>\$1,4292,379</u>	0.746	<u>\$1,0671,776</u>
3	7	2013	<u>1,463-2,435</u>	\$0.990	<u>\$1,4482,409</u>	0.711	<u>\$1,0291,713</u>
4	8	2014	<u>1,463-2,435</u>	\$0.002	<u>\$1,4662,440</u>	0.677	<u>\$ 9921,651</u>
5	9	2015	<u>1,463-2,435</u>	\$0.015	<u>\$1,4842,470</u>	0.645	<u>\$ 9561,592</u>
6	10	2016	<u>1,463-2,435</u>	\$0.027	<u>\$1,5022,500</u>	0.614	<u>\$ 9221,535</u>
7	11	2017	<u>1,463-2,435</u>	\$0.039	<u>\$1,5202,531</u>	0.585	<u>\$ 8891,480</u>
8	12	2018	<u>1,463-2,435</u>	\$0.052	<u>\$1,5382,561</u>	0.557	<u>\$ 8571,426</u>
9	13	2019	<u>1,463-2,435</u>	\$0.064	<u>\$1,5562,591</u>	0.530	<u>\$ 8251,374</u>
10	14	2020	<u>1,463-2,435</u>	\$0.077	<u>\$1,5742,621</u>	0.505	<u>\$ 7951,324</u>
11	15	2021	<u>1,463-2,435</u>	\$0.089	<u>\$1,5932,651</u>	0.481	<u>\$ 7661,275</u>
12	16	2022	<u>1,463-2,435</u>	\$0.101	<u>\$1,6112,681</u>	0.458	<u>\$ 7381,228</u>
13	17	2023	<u>1,463-2,435</u>	\$0.114	<u>\$1,6292,712</u>	0.436	<u>\$ 7111,183</u>
14	18	2024	<u>1,463-2,435</u>	\$0.126	<u>\$1,6472,742</u>	0.416	<u>\$ 6841,139</u>
15	19	2025	<u>1,463-2,435</u>	\$0.139	<u>\$1,6652,772</u>	0.396	<u>\$ 6591,097</u>
16	20	2026	<u>1,463-2,435</u>	\$0.151	<u>\$1,6832,802</u>	0.377	<u>\$ 6341,056</u>
17	21	2027	<u>1,463-2,435</u>	\$0.163	<u>\$1,7012,832</u>	0.359	<u>\$ 6111,017</u>
18	22	2028	<u>1,463-2,435</u>	\$0.176	<u>\$1,7202,863</u>	0.342	<u>\$ 588979</u>
19	23	2029	<u>1,463-2,435</u>	\$1.188	<u>\$1,7382,893</u>	0.326	<u>\$ 566942</u>
20	24	2030	<u>1,463-2,435</u>	\$1.201	<u>\$1,7562,923</u>	0.310	<u>\$ 544906</u>
21	25	2031	<u>1,463-2,435</u>	\$1.213	<u>\$1,7742,953</u>	0.295	<u>\$ 524872</u>
22	26	2032	<u>1,463-2,435</u>	\$1.225	<u>\$1,7922,983</u>	0.281	<u>\$ 504839</u>
23	27	2033	<u>1,463-2,435</u>	\$1.238	<u>\$1,8103,014</u>	0.268	<u>\$ 485807</u>
24	28	2034	<u>1,463-2,435</u>	\$1.250	<u>\$1,8283,044</u>	0.255	<u>\$ 466776</u>
25	29	2035	<u>1,463-2,435</u>	\$1.263	<u>\$1,8473,074</u>	0.243	<u>\$ 449747</u>
26	30	2036	<u>1,463-2,435</u>	\$1.275	<u>\$1,8653,104</u>	0.231	<u>\$ 431718</u>
27	31	2037	<u>1,463-2,435</u>	\$1.287	<u>\$1,8833,134</u>	0.220	<u>\$ 415691</u>
28	32	2038	<u>1,463-2,435</u>	\$1.300	<u>\$1,9013,165</u>	0.210	<u>\$ 399664</u>
29	33	2039	<u>1,463-2,435</u>	\$1.312	<u>\$1,9193,195</u>	0.200	<u>\$ 384639</u>
30	34	2040	<u>1,463-2,435</u>	\$1.325	<u>\$1,9373,225</u>	0.190	<u>\$ 369614</u>
Cumulative present value sum (all years):							\$

**Table F-3-4 Estimated Direct Economic Impacts by Year for Commercial Fisheries = Commercial Fisheries Landings Worksheet Using Projected Unit Prices (\$/lb) Annual Value of Landings for the Estimated Recommended Safety and Security Zone (1,210 Yds)**

	Year	Estimated Pounds 1,000 Corresponding to 1,210 Yard Safety and Security Zone	Projected Price \$/lb	Estimated Value at Projected Unit Prices 1,000(1,210 Yards)	Discount Rate = 5.0%	Annual Discounted Values 1,000Value
						<b>21,51035,809</b>
Average annual equivalent landings:						<b>\$1,3282,211</b>

Table F-3-4 displays the projected annual average value of commercial fisheries landings by each year over the Project's economic life. The estimated commercial landings in pounds were held constant over the projection period but the annual unit value (\$/lb), used to calculate the annual value of landings, was increased over time based on the historic trend growth rate for all combined species. The long-term or cumulative impact over the 30 year life of the Project would vary between \$22,000 and \$53,000 in cumulative present value terms.

Figure 3-5 shows the historic time series for the combined commercial species in dollars per pound and the trend line used to project forward this weighted average unit value for all species.



Source: NOAA Fisheries

**Figure 3-5 Unit Price (\$/lb) for Combined Commercial Fish Species Caught (NYS & CT) between LIS East and West Boundaries**

### **3.2 Estimated Indirect and Total Economic Impacts**

This section uses the estimated average annual value of commercial landings over the life of the Project to estimate the total economic impact contribution to NYS from the safety and security portion of the LIS.

#### **3.2.1 The IMPLAN Economic Input-Output Model**

The IMPLAN model was used to estimate the total economic impacts to NYS produced by the commercial fishery landings associated with the ~~estimated~~**recommended** safety and security zone ocean area. Total economic impacts take into account the indirect and induced impacts generated from the direct economic impacts or value of fish landings. Revenues from commercial fisheries landings are spent by fishermen on supplies, equipment, boat repairs, fuel, insurance and other items required to sustain commercial operations.

#### **3.2.2 Estimated Total Economic Impacts-Average Year and Long-Term**

Economic impacts can be described by several indicators. The broadest measure of impact is called total industry output, which is equal to the total value of goods and services. Economic impacts are also measured by employee earnings, value added in production and employment. Value added in production represents the sum of employee compensation, proprietor income, other property income and indirect business taxes.

The economic impacts associated with the potential loss of commercial fisheries revenues were estimated for an average year and also over the long-term 30 year operational life of the Project. The long-term impacts were estimated for each year over the life of the Project and also expressed as a cumulative present value sum. The cumulative present value sum is a measure of the total long-term impact in present worth terms.

Table F-3-5 summarizes the estimated economic impacts for the ~~estimated~~**recommended** safety and security zone area. Compared to the projected impacts for the commercial lobster fisheries, the impacts anticipated to commercial fisheries would be relatively small or negligible. There would be virtually no impact on employment levels for the

commercial fishing industry attributable to the loss of access to the waters taken by the security and safety zone.

Table F-3-6 shows the annual total industry output, the broadest measure of total economic impacts for an average year and the cumulative present worth measured over the 30 year economic life of the project. Tables F-3-7 through F-3-9 show the actual worksheets used to calculate other measures of economic impacts over the Project's operational life time to NYS.

**Table F-3-5 Summary of Economic Impacts to NYS Commercial Fisheries Associated with Ocean Area Size Equivalent to the ~~Estimated~~Recommended Safety and Security Zone-Average Year and Long-Term Cumulative Impacts**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
<b>Total Industry Output</b>		
Direct	<del>\$1,328,211</del>	<del>\$21,510,35,809</del>
Indirect	<del>\$514,855</del>	<del>\$8,321,13,853</del>
Induced	<del>\$810,1,348</del>	<del>\$13,112,21,828</del>
Total	<del>\$2,652,4,415</del>	<del>\$42,943,71,489</del>
<b>Employee Compensation</b>		
Direct	<del>\$308,512</del>	<del>\$4,980,8,290</del>
Indirect	<del>\$178,296</del>	<del>\$2,877,4,789</del>
Induced	<del>\$257,428</del>	<del>\$4,163,6,930</del>
Total	<del>\$742,1,236</del>	<del>\$12,019,20,009</del>
<b>Total Value Added</b>		
Direct	<del>\$827,1,376</del>	<del>\$13,385,22,283</del>
Indirect	<del>\$297,494</del>	<del>\$4,802,7,994</del>
Induced	<del>\$521,868</del>	<del>\$8,444,14,057</del>
Total	<del>\$1,645,2,738</del>	<del>\$26,632,44,334</del>



**Table F-3-6 Commercial Fisheries - Total Industry Output to NYS Associated with LIS  
Area Equivalent in Size to the Estimated Recommended Safety and Security  
Zone**

						Discount Rate =	Discounted Annual Values				
Year		Direct	Indirect	Induced	Total	5.0%	Direct	Indirect	Induced	Total	
0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -	
1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -	
2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -	
3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -	
1	4	2010	\$ 2,319	\$ 897	\$ 1,414	\$ 4,630	0.823	\$ 1,908	\$ 738	\$ 1,163	\$ 3,809
2	5	2011	\$ 2,349	\$ 909	\$ 1,432	\$ 4,690	0.784	\$ 1,841	\$ 712	\$ 1,122	\$ 3,675
3	6	2012	\$ 2,380	\$ 921	\$ 1,450	\$ 4,751	0.746	\$ 1,776	\$ 687	\$ 1,082	\$ 3,545
4	7	2013	\$ 2,410	\$ 932	\$ 1,469	\$ 4,811	0.711	\$ 1,713	\$ 663	\$ 1,044	\$ 3,419
5	8	2014	\$ 2,440	\$ 944	\$ 1,487	\$ 4,871	0.677	\$ 1,651	\$ 639	\$ 1,007	\$ 3,297
6	9	2015	\$ 2,470	\$ 956	\$ 1,506	\$ 4,931	0.645	\$ 1,592	\$ 616	\$ 971	\$ 3,179
7	10	2016	\$ 2,500	\$ 967	\$ 1,524	\$ 4,992	0.614	\$ 1,535	\$ 594	\$ 936	\$ 3,064
8	11	2017	\$ 2,531	\$ 979	\$ 1,543	\$ 5,052	0.585	\$ 1,480	\$ 572	\$ 902	\$ 2,954
9	12	2018	\$ 2,561	\$ 991	\$ 1,561	\$ 5,112	0.557	\$ 1,426	\$ 552	\$ 869	\$ 2,847
10	13	2019	\$ 2,591	\$ 1,002	\$ 1,579	\$ 5,173	0.530	\$ 1,374	\$ 532	\$ 838	\$ 2,743
11	14	2020	\$ 2,621	\$ 1,014	\$ 1,598	\$ 5,233	0.505	\$ 1,324	\$ 512	\$ 807	\$ 2,643
12	15	2021	\$ 2,651	\$ 1,026	\$ 1,616	\$ 5,293	0.481	\$ 1,275	\$ 493	\$ 777	\$ 2,546
13	16	2022	\$ 2,681	\$ 1,037	\$ 1,635	\$ 5,353	0.458	\$ 1,228	\$ 475	\$ 749	\$ 2,452
14	17	2023	\$ 2,712	\$ 1,049	\$ 1,653	\$ 5,414	0.436	\$ 1,183	\$ 458	\$ 721	\$ 2,362
15	18	2024	\$ 2,742	\$ 1,061	\$ 1,671	\$ 5,474	0.416	\$ 1,139	\$ 441	\$ 694	\$ 2,275
16	19	2025	\$ 2,772	\$ 1,072	\$ 1,690	\$ 5,534	0.396	\$ 1,097	\$ 424	\$ 669	\$ 2,190
17	20	2026	\$ 2,802	\$ 1,084	\$ 1,708	\$ 5,594	0.377	\$ 1,056	\$ 409	\$ 644	\$ 2,108
18	21	2027	\$ 2,832	\$ 1,096	\$ 1,727	\$ 5,655	0.359	\$ 1,017	\$ 393	\$ 620	\$ 2,030
19	22	2028	\$ 2,863	\$ 1,107	\$ 1,745	\$ 5,715	0.342	\$ 979	\$ 379	\$ 597	\$ 1,954
20	23	2029	\$ 2,893	\$ 1,119	\$ 1,763	\$ 5,775	0.326	\$ 942	\$ 364	\$ 574	\$ 1,880
21	24	2030	\$ 2,923	\$ 1,131	\$ 1,782	\$ 5,836	0.310	\$ 906	\$ 351	\$ 552	\$ 1,809
22	25	2031	\$ 2,953	\$ 1,142	\$ 1,800	\$ 5,896	0.295	\$ 872	\$ 337	\$ 532	\$ 1,741
23	26	2032	\$ 2,983	\$ 1,154	\$ 1,819	\$ 5,956	0.281	\$ 839	\$ 325	\$ 511	\$ 1,675
24	27	2033	\$ 3,014	\$ 1,166	\$ 1,837	\$ 6,016	0.268	\$ 807	\$ 312	\$ 492	\$ 1,611
25	28	2034	\$ 3,044	\$ 1,178	\$ 1,855	\$ 6,077	0.255	\$ 776	\$ 300	\$ 473	\$ 1,550
26	29	2035	\$ 3,074	\$ 1,189	\$ 1,874	\$ 6,137	0.243	\$ 747	\$ 289	\$ 455	\$ 1,491
27	30	2036	\$ 3,104	\$ 1,201	\$ 1,892	\$ 6,197	0.231	\$ 718	\$ 278	\$ 438	\$ 1,434
28	31	2037	\$ 3,134	\$ 1,213	\$ 1,911	\$ 6,257	0.220	\$ 691	\$ 267	\$ 421	\$ 1,379
29	32	2038	\$ 3,165	\$ 1,224	\$ 1,929	\$ 6,318	0.210	\$ 664	\$ 257	\$ 405	\$ 1,326
30	33	2039	\$ 3,195	\$ 1,236	\$ 1,947	\$ 6,378	0.200	\$ 639	\$ 247	\$ 389	\$ 1,275
31	34	2040	\$ 3,225	\$ 1,248	\$ 1,966	\$ 6,438	0.190	\$ 614	\$ 237	\$ 374	\$ 1,226
Cumulative present value sum (all years)							\$ 35,809	\$ 13,853	\$ 21,828	\$ 71,489	
Average annual equivalent value							\$2,211	\$855	\$1,348	\$4,415	

**Table F-3-7 Commercial Fisheries – Employee Compensation Impact to NYS Associated with LIS Area Equivalent in Size to the Estimated Recommended Safety and Security Zone**

						Discount Rate = 5.0%	Discounted Annual Values				
Year		Direct	Indirect	Induced	Total		Direct	Indirect	Induced	Total	
0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -	
1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -	
2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -	
3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -	
1	4	2010	\$ 537	\$ 310	\$ 449	\$ 1,296	0.823	\$ 442	\$ 255	\$ 369	\$ 1,066
2	5	2011	\$ 544	\$ 314	\$ 455	\$ 1,313	0.784	\$ 426	\$ 246	\$ 356	\$ 1,029
3	6	2012	\$ 551	\$ 318	\$ 461	\$ 1,330	0.746	\$ 411	\$ 237	\$ 344	\$ 992
4	7	2013	\$ 558	\$ 322	\$ 466	\$ 1,347	0.711	\$ 396	\$ 229	\$ 331	\$ 957
5	8	2014	\$ 565	\$ 326	\$ 472	\$ 1,363	0.677	\$ 382	\$ 221	\$ 320	\$ 923
6	9	2015	\$ 572	\$ 330	\$ 478	\$ 1,380	0.645	\$ 369	\$ 213	\$ 308	\$ 890
7	10	2016	\$ 579	\$ 334	\$ 484	\$ 1,397	0.614	\$ 355	\$ 205	\$ 297	\$ 858
8	11	2017	\$ 586	\$ 338	\$ 490	\$ 1,414	0.585	\$ 343	\$ 198	\$ 286	\$ 827
9	12	2018	\$ 593	\$ 342	\$ 496	\$ 1,431	0.557	\$ 330	\$ 191	\$ 276	\$ 797
10	13	2019	\$ 600	\$ 346	\$ 501	\$ 1,448	0.530	\$ 318	\$ 184	\$ 266	\$ 768
11	14	2020	\$ 607	\$ 351	\$ 507	\$ 1,465	0.505	\$ 306	\$ 177	\$ 256	\$ 740
12	15	2021	\$ 614	\$ 355	\$ 513	\$ 1,481	0.481	\$ 295	\$ 171	\$ 247	\$ 713
13	16	2022	\$ 621	\$ 359	\$ 519	\$ 1,498	0.458	\$ 284	\$ 164	\$ 238	\$ 686
14	17	2023	\$ 628	\$ 363	\$ 525	\$ 1,515	0.436	\$ 274	\$ 158	\$ 229	\$ 661
15	18	2024	\$ 635	\$ 367	\$ 531	\$ 1,532	0.416	\$ 264	\$ 152	\$ 220	\$ 637
16	19	2025	\$ 642	\$ 371	\$ 536	\$ 1,549	0.396	\$ 254	\$ 147	\$ 212	\$ 613
17	20	2026	\$ 649	\$ 375	\$ 542	\$ 1,566	0.377	\$ 244	\$ 141	\$ 204	\$ 590
18	21	2027	\$ 656	\$ 379	\$ 548	\$ 1,583	0.359	\$ 235	\$ 136	\$ 197	\$ 568
19	22	2028	\$ 663	\$ 383	\$ 554	\$ 1,600	0.342	\$ 227	\$ 131	\$ 189	\$ 547
20	23	2029	\$ 670	\$ 387	\$ 560	\$ 1,616	0.326	\$ 218	\$ 126	\$ 182	\$ 526
21	24	2030	\$ 677	\$ 391	\$ 566	\$ 1,633	0.310	\$ 210	\$ 121	\$ 175	\$ 506
22	25	2031	\$ 684	\$ 395	\$ 572	\$ 1,650	0.295	\$ 202	\$ 117	\$ 169	\$ 487
23	26	2032	\$ 691	\$ 399	\$ 577	\$ 1,667	0.281	\$ 194	\$ 112	\$ 162	\$ 469
24	27	2033	\$ 698	\$ 403	\$ 583	\$ 1,684	0.268	\$ 187	\$ 108	\$ 156	\$ 451
25	28	2034	\$ 705	\$ 407	\$ 589	\$ 1,701	0.255	\$ 180	\$ 104	\$ 150	\$ 434
26	29	2035	\$ 712	\$ 411	\$ 595	\$ 1,718	0.243	\$ 173	\$ 100	\$ 145	\$ 417
27	30	2036	\$ 719	\$ 415	\$ 601	\$ 1,735	0.231	\$ 166	\$ 96	\$ 139	\$ 401
28	31	2037	\$ 726	\$ 419	\$ 607	\$ 1,751	0.220	\$ 160	\$ 92	\$ 134	\$ 386
29	32	2038	\$ 733	\$ 423	\$ 612	\$ 1,768	0.210	\$ 154	\$ 89	\$ 129	\$ 371
30	33	2039	\$ 740	\$ 427	\$ 618	\$ 1,785	0.200	\$ 148	\$ 85	\$ 124	\$ 357
31	34	2040	\$ 747	\$ 431	\$ 624	\$ 1,802	0.190	\$ 142	\$ 82	\$ 119	\$ 343
Cumulative present value sum (all years)							\$ 8,290	\$ 4,789	\$ 6,930	\$ 20,009	
Average annual equivalent value							\$512	\$296	\$428	\$1,236	



**Table F-3-8 Commercial Fisheries - Total Value Added Associated with LIS Area  
Equivalent in Size to the Estimated Recommended Safety and Security Zone**

						Discount Rate = 5.0%	Discounted Annual Values				
Year		Direct	Indirect	Induced	Total		Direct	Indirect	Induced	Total	
0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -	
1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -	
2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -	
3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -	
1	4	2010	\$ 1,443	\$ 518	\$ 910	\$ 2,871	0.823	\$ 1,187	\$ 426	\$ 749	\$ 2,362
2	5	2011	\$ 1,462	\$ 524	\$ 922	\$ 2,909	0.784	\$ 1,145	\$ 411	\$ 723	\$ 2,279
3	6	2012	\$ 1,481	\$ 531	\$ 934	\$ 2,946	0.746	\$ 1,105	\$ 396	\$ 697	\$ 2,198
4	7	2013	\$ 1,500	\$ 538	\$ 946	\$ 2,983	0.711	\$ 1,066	\$ 382	\$ 672	\$ 2,120
5	8	2014	\$ 1,518	\$ 545	\$ 958	\$ 3,021	0.677	\$ 1,028	\$ 369	\$ 648	\$ 2,045
6	9	2015	\$ 1,537	\$ 551	\$ 970	\$ 3,058	0.645	\$ 991	\$ 355	\$ 625	\$ 1,971
7	10	2016	\$ 1,556	\$ 558	\$ 982	\$ 3,096	0.614	\$ 955	\$ 343	\$ 603	\$ 1,900
8	11	2017	\$ 1,575	\$ 565	\$ 993	\$ 3,133	0.585	\$ 921	\$ 330	\$ 581	\$ 1,832
9	12	2018	\$ 1,593	\$ 572	\$ 1,005	\$ 3,170	0.557	\$ 887	\$ 318	\$ 560	\$ 1,765
10	13	2019	\$ 1,612	\$ 578	\$ 1,017	\$ 3,208	0.530	\$ 855	\$ 307	\$ 539	\$ 1,701
11	14	2020	\$ 1,631	\$ 585	\$ 1,029	\$ 3,245	0.505	\$ 824	\$ 296	\$ 520	\$ 1,639
12	15	2021	\$ 1,650	\$ 592	\$ 1,041	\$ 3,283	0.481	\$ 794	\$ 285	\$ 501	\$ 1,579
13	16	2022	\$ 1,669	\$ 599	\$ 1,053	\$ 3,320	0.458	\$ 764	\$ 274	\$ 482	\$ 1,521
14	17	2023	\$ 1,687	\$ 605	\$ 1,064	\$ 3,357	0.436	\$ 736	\$ 264	\$ 464	\$ 1,465
15	18	2024	\$ 1,706	\$ 612	\$ 1,076	\$ 3,395	0.416	\$ 709	\$ 254	\$ 447	\$ 1,411
16	19	2025	\$ 1,725	\$ 619	\$ 1,088	\$ 3,432	0.396	\$ 683	\$ 245	\$ 431	\$ 1,358
17	20	2026	\$ 1,744	\$ 626	\$ 1,100	\$ 3,469	0.377	\$ 657	\$ 236	\$ 415	\$ 1,308
18	21	2027	\$ 1,763	\$ 632	\$ 1,112	\$ 3,507	0.359	\$ 633	\$ 227	\$ 399	\$ 1,259
19	22	2028	\$ 1,781	\$ 639	\$ 1,124	\$ 3,544	0.342	\$ 609	\$ 218	\$ 384	\$ 1,212
20	23	2029	\$ 1,800	\$ 646	\$ 1,136	\$ 3,582	0.326	\$ 586	\$ 210	\$ 370	\$ 1,166
21	24	2030	\$ 1,819	\$ 653	\$ 1,147	\$ 3,619	0.310	\$ 564	\$ 202	\$ 356	\$ 1,122
22	25	2031	\$ 1,838	\$ 659	\$ 1,159	\$ 3,656	0.295	\$ 543	\$ 195	\$ 342	\$ 1,080
23	26	2032	\$ 1,857	\$ 666	\$ 1,171	\$ 3,694	0.281	\$ 522	\$ 187	\$ 329	\$ 1,039
24	27	2033	\$ 1,875	\$ 673	\$ 1,183	\$ 3,731	0.268	\$ 502	\$ 180	\$ 317	\$ 999
25	28	2034	\$ 1,894	\$ 680	\$ 1,195	\$ 3,768	0.255	\$ 483	\$ 173	\$ 305	\$ 961
26	29	2035	\$ 1,913	\$ 686	\$ 1,207	\$ 3,806	0.243	\$ 465	\$ 167	\$ 293	\$ 925
27	30	2036	\$ 1,932	\$ 693	\$ 1,219	\$ 3,843	0.231	\$ 447	\$ 160	\$ 282	\$ 889
28	31	2037	\$ 1,950	\$ 700	\$ 1,230	\$ 3,881	0.220	\$ 430	\$ 154	\$ 271	\$ 855
29	32	2038	\$ 1,969	\$ 706	\$ 1,242	\$ 3,918	0.210	\$ 413	\$ 148	\$ 261	\$ 822
30	33	2039	\$ 1,988	\$ 713	\$ 1,254	\$ 3,955	0.200	\$ 397	\$ 143	\$ 251	\$ 791
31	34	2040	\$ 2,007	\$ 720	\$ 1,266	\$ 3,993	0.190	\$ 382	\$ 137	\$ 241	\$ 760
Cumulative present value sum (all years)							\$ 22,283	\$ 7,994	\$ 14,057	\$ 44,334	
Average annual equivalent value							\$1,376	\$494	\$868	\$2,738	

**Table F- 3-9 Commercial Fisheries - Tax Revenues Associated with Total Economic Activity for LIS Area Equivalent in Size to the EstimatedRecommended Safety and Security Zone**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
Federal	\$140233	\$2,2683,776
State/Local	\$167279	\$2,7114,513
Total	\$307512	\$4,9798,288

The anticipated impacts to NYS commercial fisheries associated with the long-term loss of access of LIS area that would potentially be used for the recommended safety and security zone would be minor and even negligible in some instances.

### 3.3 Potential Habitat Sanctuary Impacts

It is possible that the loss of fishing access to the safety and security zone area may also enhance select populations of commercially valuable species by functioning as a de facto haven where fishermen are precluded from entering and placing stress on these populations. The restricted access may potentially lead to a rebound in overstressed species by allowing select populations at formative lifecycle stages to recover unimpeded by the threat of fishing gear and boats. This potential impact has not been quantified or estimated but should be considered as a form of de facto mitigation over the life of the Project. Adjacent fishing grounds may possibly benefit as select populations would be enhanced by the loss of access attributable to the recommended safety and security zone.

## **4.0 LONG ISLAND SOUND RECREATION**

This section reviews the economic importance of recreational resources provided by LIS as background for determining the potential impacts to portions of the resource from the Broadwater Project's activities. These activities include both the construction period impacts and the long-term impacts expected from the establishment of a safety and security zone surrounding the FSRU during operations.

The recreational economic impacts analysis from the Broadwater Project is based on evaluating past valuation and impacts from local research conducted for LIS and showing the potential relative impacts of the Project *vis a vis* the estimated values for this larger area. This approach allows for a more informed perspective that places the economic value impacts in the proper context.

### **4.1 Background and Key Recent Trends**

The major recreational uses of the Long Island Sound include such activities as swimming, beach going, recreational/sport fishing, and recreational boating. Information and data was gathered on these recreational activities to determine annual economic impacts to the LIS community, in addition to developing a determination of potential impacts resulting from the Broadwater Project.

### **4.2 Users and Visitation**

Individuals utilizing the LIS for recreational purposes are either residents of the surrounding communities in New York and Connecticut or they are tourists from outside of the area. For residents, populations of the municipalities on LIS are all experiencing rapid growth. For example, Suffolk County, which is the most populous county bordering the LIS in the Project area, experienced an increase of 97,505 or 7.4% from 1990 to 2000. The 2000 U.S. census counted 1,419,369 residents in Suffolk County and had a 1990 census population of 1,321,864 (US Census 2006). *See* Resource Report No. 5, Socioeconomics, for additional population statistics. Assuming constant recreational participation rates, the increase in population will correspond to growing demand and participation in recreational activities on LIS by residents.

Trends in tourist visitation to LIS have been estimated based upon data received on hotel stays from the Long Island Convention and Visitors Bureau and Sports (LICVB) Commission. From 1999 to 2005, it was estimated that the number of hotel stays has remained essentially constant for Long Island (Nassau and Suffolk Counties). There was a slight drop in occupancy rates between these years; however there was also an increase in over 2,000 rooms to the hotel/motel room inventory. It was assumed that based solely on hotel stays, that tourist visitation to Long Island has remained essentially constant over the past five to six years, even though tourism as a whole over that period experienced a slowdown related to national security events.

Over the course of the next three years (2006-2008), an estimated 12 hotel properties are scheduled to open, adding approximately over 1,600 additional rooms to the current inventory (LICVB 2006). This development suggests that visitation and user days (a user day involves one person participating in an activity for a portion or all of a day) for LIS will, at a minimum, remain constant, but more likely will increase with respect to non-resident tourism/visitation.

#### **4.3 Recreational Spending**

The quantification of recreational spending in the Long Island Sound area will be divided into beach swimming, recreational/sport fishing, and recreational boating due to data availability and distinction between activities. Although Long Island Sound has been the subject of numerous studies related to such topics as water quality and biological issues, there are a limited number that have concentrated on the economic impacts from recreation and the recreational amenity valuation of the Sound.

In 1992, a study of the economic impact of these three defined recreational activities was conducted by Dr. Altobello of the University of Connecticut – *The Economic Importance of Long Island Sound's Water Quality Dependent Activities*. The results of the study are presented in Table F-4-1. The data contained in the table includes total user values, which represent the value of the resource to the actual users. Direct effects include actual spending on goods and services in the community related to recreational activities. The indirect effects represent impacts from direct recreational spending on industries throughout the region. Induced

effects represent the spending impacts from effected households along the supply chain supporting recreational spending.

**Table F-4-1 Total Recreational Values for Long Island Sound, 1990 and 2005 dollars**

	Total User Values (million \$)		Direct Effects (million \$)		Multiplier Effects (Indirect + Induced) (million \$)		Total (million \$)	
	1990	2005	1990	2005	1990	2005	1990	2005
<b>Connecticut</b>								
Beach Swimming	\$99.83	\$134.66	\$159.10	\$214.60	\$202.35	\$272.94	\$461.28	\$622.20
Sport Fishing	\$11.08	\$14.95	\$258.46	\$348.62	\$366.17	\$493.91	\$635.71	\$857.48
Boating	\$56.23	\$75.85	\$836.00	\$1,127.64	\$1,003.20	\$1,353.16	\$1,895.43	\$2,556.65
Connecticut Totals	\$167.14	\$225.45	\$1,253.56	\$1,690.86	\$1,571.72	\$2,120.01	\$2,992.42	\$4,036.32
<b>New York</b>								
Beach Swimming	\$82.57	\$111.37	\$131.59	\$177.49	\$167.36	\$225.74	\$381.52	\$514.61
Sport Fishing	\$11.13	\$15.01	\$173.09	\$233.47	\$245.22	\$330.76	\$429.44	\$579.25
Boating	\$42.33	\$57.10	\$629.31	\$848.84	\$755.17	\$1,018.61	\$1,426.81	\$1,924.55
New York Totals	\$136.03	\$183.48	\$933.99	\$1,259.81	\$1,167.75	\$1,575.12	\$2,237.77	\$3,018.41
<b>CT and NY Totals</b>	<b>\$303.17</b>	<b>\$408.93</b>	<b>\$2,187.55</b>	<b>\$2,950.67</b>	<b>\$2,739.47</b>	<b>\$3,695.13</b>	<b>\$5,230.19</b>	<b>\$7,054.73</b>

Source: Altobello 1992 and Bureau of Labor Statistics (BLS) 2006

Since this study was conducted in 1990 dollars, the results have been inflated to 2005 dollars using the Consumer Price Index (CPI). This study is the most commonly referenced study when speaking to the “economic impact of recreational activities in Long Island Sound,” and is the source of the commonly used figure of \$5.2 billion of economic impact that has been cited in the press. By using the CPI to update this 1990 impact estimate to current price levels, it was estimated that the economic impact from these recreational activities now approaches at least \$7.1 billion for the LIS. This procedure is for ballpark estimating purposes and is based on assuming similar participation levels among residents and tourists (BLS 2006). The updating of the earlier estimate does not consider demand shifts that may have occurred since the original study was completed.

The three major recreational activities are further defined and discussed in the sections below, including presentation of additional studies outlining economic impacts and the potential effect of the Broadwater Project on this resource.

#### **4.3.1 Beach Swimming**

Beach visitation and beach swimming result in a variety of economic impacts to the local community through retail purchases, food and beverage purchases, accommodations, and miscellaneous trip expenses (i.e., gas, tolls, etc.). As presented in Table F-4-1, the total



economic impact of beach swimming in Connecticut and New York was \$622.2 million and \$514.61 million respectively. This equates to a \$1,136.81 million impact total for the Long Island Sound area in 2005 dollars.

The only adjustment made to the final results of the Altobello study was an inflation adjustment to 2005 dollars based upon the CPI. An additional adjustment for the overall change in the local population and visitation numbers would be another adjustment that could be made. It is estimated that the overall population from 1990 to 2000 in the Long Island Sound study area, as designated by the 1992 report, has increased by approximately 7.5% (*see* Table F-4-2). The updated economic impact estimates assume that similar recreational participation rates would be in effect in 2005. It is acknowledged that these rates may have changed since 1990. However, for order of magnitude estimation purposes, the escalated economic impact estimates provide a broad perspective on the total importance of this resource to LIS. The escalated estimates show that the overall impact of beach swimming in the LIS area has increased to over \$1.1 billion annually (Altobello 1992).

**Table F-4-2 Change in Long Island Sound Population from 1990 to 2000**

	1990	2000	% change
<b>Connecticut</b>			
New London	254,957	259,088	1.62%
Middlesex	143,196	155,071	8.29%
New Haven	804,219	824,008	2.46%
Fairfield	827,645	882,567	6.64%
<b>Total</b>	<b>2,030,017</b>	<b>2,120,734</b>	<b>4.47%</b>
<b>New York</b>			
Westchester	874,866	923,459	5.55%
Nassau	1,287,348	1,334,544	3.67%
Suffolk	1,321,864	1,419,369	7.38%
Queens	1,951,958	2,229,379	14.21%
<b>Total</b>	<b>5,436,036</b>	<b>5,906,751</b>	<b>8.66%</b>
<b>LIS Total</b>	<b>7,466,053</b>	<b>8,027,485</b>	<b>7.52%</b>

Source: US Census 2006

#### 4.3.2 Recreational Boating

The 1992 study looking at the economic impact of recreational spending on various activities – including boating – estimated the economic impact of recreational boating on Long Island Sound (sum of direct, indirect and induced effects plus the user value) in 1990 as \$3.322 billion, of which the NYS portion was \$1.427 billion. Inflated to current prices, that

would translate to an overall impact of \$4.481 billion in total and \$1.925 billion for NYS (Altobello 1992).

A more recent study on recreational boating was completed in 2003 under the NY Sea Grant – *Recreational Boating Expenditures in 2003 in New York State and Their Economic Impacts*. This study breaks down impacts by geographic region; however, since it is only a state-wide study there are no economic impacts noted for Connecticut. In addition, the 2003 NY Sea Grant study indicated a much lower overall economic impact for recreational boating than the 1992 study. It estimated that the total economic impact for the New York City Long Island Metropolitan Area was \$843 million in 2003 dollars (adjusted to 2005 dollars, this would equate to \$907 million). This is only half of the \$1.925 billion impact that was estimated in the 1992 study.

According to the 2003 NY Sea Grant study, recreational boating activity has been increasing throughout NYS. There were 529,844 boats registered in 2003, which represents an increase of over 20% in the past ten years (Connelly et. al. 2004). Almost all of these registered boats were used for recreation, and only 1% indicated they used their boat as part of a charter business (Connelly et. al. 2004).

Some specific statistics presented in this study include activities while boating and the type of boats. While boating, about two-thirds of boaters also participated in fishing activities and a majority also indicated that they enjoyed cruising or sailing. Fewer boaters in downstate New York participated in water skiing or tubing compared with upstate boaters. The boat types registered in downstate New York broke down as 64.1% standard power boats, 23.0% were personal watercraft and 13% were sailboats. Individuals in downstate New York also typically owned larger boats (Connelly et. al. 2004).

The mean total trip-related expenditures per boater were \$1,380 on at-site and en route trip expenditures in 2003 (Connelly et. al. 2004). Three-quarters of this spending occurred outside of the marina or yacht club. Table F-4-3 depicts a breakdown of typical trip expenditures for New York State.

**Table F-4-3 Mean and Total Statewide Trip-Related Expenditures at the Boating Location And En-Route in 2003**

Expenditure Category	Mean Expenditure per Boater	% Total
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<b>At-site expenditures</b>		
Marinas and yacht clubs	\$359	26%
Gas stations	\$214	16%
Restaurants and bars	\$184	13%
Grocery and convenience type stores	\$148	11%
Bait and tackle shops	\$62	4%
Boat launching and mooring fees	\$58	4%
Lodging	\$58	4%
Entertainment and all other expenses	\$56	4%
All other retail purchases	\$55	4%
Tournament fees	\$12	1%
<b>Total At-Site Expenditures</b>	<b>\$1,206</b>	<b>-</b>
<b>En-Route Expenditures</b>	<b>\$174</b>	<b>13%</b>
<b>Total Expenditures</b>	<b>\$1,380</b>	<b>-</b>

Source: Connelly et. al. 2004

Table F-4-4 is a breakdown of trip expenditures by geographic area in downstate New York, which may be more representative of actual spending in LIS. The mean annual expenditure per boater, per trip in LIS was \$3,112 in 2003. Adjusted for inflation, this would equate to \$3,346 in 2005 dollars.

**Table F-4-4 Trip-related (and Non-Trip Marina) Expenditures by Category and per Boater for Downstate New York Regions in 2003**

Expenditure Category	NYC Area	Long Island	Suffolk County	Long Island Sound
<b>At-site expenditures</b>				
Marinas and yacht clubs	\$16,714,906	\$41,213,188	\$33,417,610	\$19,961,521
Gas stations	\$6,047,504	\$21,520,880	\$15,064,446	\$7,733,943
Restaurants and bars	\$3,271,601	\$16,527,473	\$13,314,000	\$5,685,824
Grocery and convenience type stores	\$1,526,747	\$7,595,605	\$5,887,865	\$2,537,222
Bait and tackle shops	\$1,725,026	\$8,017,583	\$5,251,339	\$2,904,050
Boat launching and mooring fees	\$1,447,435	\$8,439,561	\$6,524,390	\$4,126,807
Lodging	\$575,099	\$1,898,901	\$1,909,578	\$1,467,309
Entertainment and all other expenses	\$2,756,076	\$2,602,198	\$2,386,972	\$1,161,620
All other retail purchases	\$396,558	\$4,430,769	\$3,766,112	\$1,772,999
Tournament fees	\$237,935	\$1,406,593	\$1,220,008	\$213,983
<b>At-site non-trip expenditures</b>				
Marinas and yacht clubs*	NA	NA	NA	\$43,928,160
<b>Total At-Site Expenditures</b>	<b>\$34,698,796</b>	<b>\$113,652,750</b>	<b>\$88,742,319</b>	<b>\$91,493,437</b>
<b>En-Route Expenditures</b>	<b>\$5,650,947</b>	<b>\$7,806,594</b>	<b>\$5,622,645</b>	<b>\$3,637,704</b>
<b>Total Expenditures</b>	<b>\$40,349,743</b>	<b>\$121,459,343</b>	<b>\$94,364,964</b>	<b>\$95,131,141</b>
Number of Boaters	19,828	70,330	53,044	30,569
Mean Expenditure per Boater	\$2,035	\$1,727	\$1,779	\$3,112

Source: Connelly et. al. 2004

\* At-site, non-trip expenditures were only tracked for specific bodies of water and would include such expenditures as annual slip or mooring rental fee, haul-out, winterization, etc.

IMPLAN software was utilized in the 2003 NY Sea Grant study to estimate the indirect and induced impacts of recreational boating. In Table F-4-5, the total output and total value added impacts are presented for the Long Island Sound in both 2003 and adjusted 2005 dollars. Total output represents the value of industrial output or total sales in the regional economy. Value added represents the sum of employee compensation, proprietor income, other property income and indirect business taxes.

**Table F-4-5 Long Island Sound - Output and Total Value Added Impacts of Regional Boating Expenditures (Trip Plus Marina-Non Trip Related) on Regions Surrounding Specific Water Bodies (2003 Dollars)**

Impact/Water Body	Direct	Indirect	Induced	Total
<b>Output</b>				
Long Island Sound (2003 dollars)	\$76,875,779	\$22,716,685	\$22,816,209	\$122,405,674
Long Island Sound (2005 dollars)	\$82,666,725	\$24,427,901	\$24,534,922	\$131,626,324
<b>Total Value Added</b>				
Long Island Sound (2003 dollars)	\$46,263,142	\$15,114,438	\$14,377,713	\$74,755,295
Long Island Sound (2005 dollars)	\$49,748,080	\$16,252,988	\$15,460,766	\$80,386,508

Source: Connelly et. al. 2004

Despite the difference in the overall total economic impact of recreational boating estimated by the two studies presented, it is apparent that this recreational activity results in significant local expenditures for boating trips, supplies, equipment, food, services, and maintenance.

### 4.3.3 Recreational/Sport Fishing

The two sources used to determine the economic impact of sport fishing in Long Island Sound were the 1992 study from the University of Connecticut and a 2001 NY Sea Grant report – *The Economic Contribution of the Sport Fishing, Commercial Fishing, and Seafood Industries to New York State*. These together form the framework for the economic impact of sport fishing.

As presented in Table F-4-1 at the beginning of this section, according to Dr. Altobello's study, the specific annual economic impact of sport fishing, inflated to 2005 dollars, in Long Island Sound on New York and Connecticut was \$579.25 and \$857.48 million respectively, for a total of \$1,436.73 million. This study examines impacts to both CT and NY; however, it fails to look at trends and specific spending characteristics of marine anglers (Altobello 1992).

Detailed tables depicting marine (saltwater) fishing characteristics and trends in New York State as part of the 2001 NY Sea Grant study are below. Table F- 4-6 shows two years of data on marine angler participation. After a peak in 1994, the total number of anglers has declined annually (Techlaw 2001).

**Table F-4-6 New York State Marine Anglers, 1996 and 1998**

Number of Anglers	Activity in New York State					
	Total		New York Residents		Non Residents	
	Number	Percent	Number	Percent	Number	Percent
1996	539,540	100%	501,130	92.9%	38,410	7.1%
1998	475,720	100%	433,226	91.1%	42,494	8.9%

Source: Techlaw 2001

An important factor in sport fishing expenditures is the mode of fishing. Many individuals fish from shore, while others own a boat or hire a fishing guide company with a boat. In Table F-4-7 below, the total number of trips and mode by fishing area are presented. It should be noted that Long Island Sound is considered an "inland water" body with respect to this study (see note in Table F-4-7). The most popular fishing ~~area~~areas are inland water ways (which



would include Long Island Sound) and the most popular mode of fishing is through a private or rental boat for each fishing area.

**Table F-4-7 New York State Numbers of Trips by Mode and Fishing Area, 1998**

Mode	Inland <sup>2</sup>	Percent	Ocean <= 3 miles		Ocean > 3 miles		Total
			Percent	Percent	Percent	Percent	
Shore	1,043,064	36.0%	131,686	30.5%	N/A	0%	1,174,750
Party/Charter <sup>1</sup>	163,394	5.7%	106,071	24.6%	25,431	16.3%	294,896
Private/Rental	1,687,595	58.3%	194,141	44.9%	130,342	83.7%	2,012,078
Total	2,894,053	100%	431,898	100%	155,773	100%	3,481,724

Source: Techlaw 2001

Notes: N/A = not applicable

<sup>1</sup> Party boats conduct daily, scheduled trips and provide anglers with the ability to go fishing without advanced planning. There is a fee that covers their fishing needs. Party boat vessels carry 30 or more passengers. Charter boats carry passengers who have pre-arranged fishing trips for certain species. Fees are based on species to be fished and distance. Charter boats carry six to eight passengers, although some carry more.

<sup>2</sup> Other bodies of saltwater besides the ocean; sounds, inlets, tidal portions of rivers, bays, and estuaries.

The amount of spending by anglers in New York State by type of expenditure is presented in Table F-4-8. The highest values by type of expenditure are: (1) owned, leased property, (2) other trip expenditures, (3) special equipment, (4) fishing rods, reels, tackle, and (5) boats, motors, trailers. Although the information presented is for the entire State of New York, it defines some of the typical expenditures that anglers experience, and can be applied to marine and Long Island Sound anglers (Techlaw 2001).

**Table F-4-8 Contribution of New York Sport Fishing to State Economy by Type of Expenditure, 1996, Dollar Value (millions of 1999 dollars)**

Type of Expenditure	Value of Expenditures	Impact on Sales of Goods and Services	Total Contribution
Sport fishing expenditures	\$541.10	\$452.50	\$993.60
■ Head and charter boat fees	\$56.00	\$57.30	\$113.30
■ Marina fees	\$52.50	\$90.90	\$143.40
■ Bait	\$42.50	\$28.60	\$71.10
■ Fishing rods, reels, tackle	\$239.70	\$221.00	\$460.60
■ Boats, motors, trailers	\$150.40	\$54.70	\$205.10
Ancillary fishing expenditures	\$1,371.50	\$1,236.40	\$2,607.90
■ Other trip expenditures	\$493.00	\$525.10	\$1,018.20
■ Auxiliary equipment	\$20.40	\$18.40	\$38.80
■ Special equipment	\$302.00	\$135.10	\$437.00
■ Miscellaneous expenses	\$37.50	\$54.50	\$92.00
■ Owned, leased property	\$518.70	\$503.20	\$1,021.90
Total Sport Fishing	\$1,912.60	\$1,688.90	\$3,601.50

Source: Techlaw 2001

The areas of NYS that would be considered marine fishing include waters of the Atlantic Ocean, Long Island Sound, various estuaries and embayments of the Atlantic and the Sound, and the tidal portion of the Hudson River. The 2001 Sea Grant Study reported total contribution by anglers in NYS by marine and freshwater activities (*see* Table F-4-9). Marine fishing accounted for approximately \$1,334.5 million in 1999 dollars. Inflated to 2005 dollars, this would equate to approximately \$1,435 million (Techlaw 2001).

**Table F-4-9 Contribution of New York Sport Fishing to State Economy by Area, 1996, Dollar Value (millions of 1999 dollars)**

Location of Fishing Activity	Value of Expenditures	Impact on Sales of Goods and Services	Total Contribution
Marine	\$708.70	\$625.80	\$1,334.50
Freshwater	\$1,203.90	\$1,063.10	\$2,267.00
Total Sport Fishing	\$1,912.60	\$1,688.90	\$3,601.50

Source: Techlaw 2001

There is no available data collected that summarizes employment in the sport fishing industry. However, sport fishing employment can be estimated by using U.S. Census sales per employee data for the services and retail businesses that make up the sport fishing industry. Using this method, it is estimated that the employment impact in the sport fishing industry is over 17,000 jobs. These jobs are a mix of full- and part-time positions (Techlaw 2001).

In addition, the spending by sport fishing anglers generates additional employment for goods and services. This employment impact is estimated at the equivalent of 19,000 full-time jobs. Estimates of sport fishing employment are presented in Table F-4-10 (Techlaw 2001).

**Table F-4-10 Contribution of New York Sport Fishing to State Economy by Area, 1996, Employment**

Location of Fishing Activity	Employment in Sport Fishing Industry (thousands of jobs)	Total Employment Impacts (thousands of FTE jobs)
Marine	6.3	7.1
Freshwater	10.8	11.9
Total Sport Fishing	17.1	19.0

Source: Techlaw 2001

#### **4.4 Potential Economic Impact from Broadwater Project**

When examined from the perspective of the total coastal zone recreational importance of Long Island Sound to the region, the potential economic impacts attributable to the Broadwater Project on the three major recreational activities described above will vary from none to negligible.

For example, swimming and beach visitation cannot be expected to be impacted as a result of the Broadwater Project due to the inherent distance from the proposed FSRU location, whereas, boating and fishing activities that could take place closer to the FSRU and the surrounding safety and security zone during Project operations could be negatively impacted. These recreational activities and estimated impacts are discussed individually below.

##### **4.4.1 Beach Swimming**

Beach visitation and swimming are activities confined, by definition, to coastal areas with beaches. The closest coastline to the proposed location of the Broadwater Project is nine miles away and does not inhibit or alter the ability of residents or tourists from participating in beach going activities or swimming. As a result, it is estimated that the Broadwater Project will have no impact on this recreational activity or its associated economic impact to the Long Island Sound area. Observations from other coastal communities around the U.S. show that beach attendance has not been affected in any material way by compatible industrial and commercial marine activities. For instance, beach users in South Florida are accustomed to

seeing large cargo and freight vessels transit the coastline within their activity view sheds. These economic activities have not detracted from the recreational experience or beach attendance as revealed in the hotel occupancy data figures.

There may be some perceived adverse impact based on the ability, from certain coastal areas and depending on weather, to see the FSRU in the Sound when either swimming or at a beach. This potential impact is discussed in Resource Report No. 8, Land Use, Recreation, and Aesthetics, and is not assumed to have a negative economic impact with respect to this recreational activity.

#### **4.4.2 Recreational Boating**

As discussed in Section 4.3.2, recreational boating on Long Island Sound is a significant economic driver and results in several billion dollars in total economic impact annually. The Boat Traffic Survey conducted for Resource Report No. 8, Land Use, Recreation and Aesthetics, which is annexed as Appendix I, outlines the approximate boating activity in the vicinity of the project site during several of the busiest boating days of the year. Beyond short-term impacts associated with construction-related activities, there are assumed to be no impacts associated with the proposed pipeline since it is on the seafloor. From the Boat Traffic Study, the following conclusions were drawn:

- Over the course of the nine boat survey days, 329 boats were recorded within 2.5 miles of the observation boat.
- Of the total, 49.5% (163/329) of the boats were recreational powerboats and 32.9% (108/329) of the boats were sailboats. Thus, 82.4% (271/329) were considered recreational boats.
- High densities of boats were recorded in proximity to Stratford Shoal (over 12 miles from the proposed FSRU location).
- 181 boats were recorded during the nine boat survey days in the vicinity of the proposed FSRU location and 44.8% of these boats observed were within 0.6 miles (1,056 yards) of the proposed FSRU location.
- This equates to approximately 2.1 boats transiting within 0.6 miles (1,056 yards) of the proposed FSRU location per survey hour.
- Once during the nine day boat survey, a regatta was observed.

The sample data provided from the Boat Traffic Survey can be used to value the recreational participation and expenditures associated with a hypothetical number of recreational



boaters in the area. It was found that 2.1 boats per survey hour came within 0.6 miles of the proposed location of the FSRU. According to the 2001 NY Sea Grant study, the mean expenditure per boater was \$3,346 in 2005 dollars. Since the Boat Traffic Study was performed during the busiest boating days of the year, it will be assumed that one boat per hour is an appropriate figure, with 10 hour days and a six month (May to October) recreational boating "season." This would equate to 1,820 total boats (assuming 1 boat per hour in a 10 hour day over the course of 26 seventy hour weeks of a boating season) that would approach the proposed FSRU annually. To be conservative, using one half of the annual expenditures from other studies (6 mo./12 mo.), it is estimated that the direct expenditures extrapolated to the estimated number of boaters associated with this seasonal period would have a total direct economic impact of \$3,044,860 = ( \$3,346/2 x 1,820).

When juxtaposed against the total expenditures for Long Island Sound (shown in Table F-4-4, inflated to 2005 dollars, of \$102,297,238, the share of recreational expenditures associated with the Project vicinity would equal about 3%. However, because there are significant adjacent available boating areas, a negative impact on recreational expenditures is unlikely. In other words, it is not plausible to assume that any of these estimated area expenditures would be lost to the region's economy. The likely scenario would be that recreational boaters would choose to avoid the area of the ~~estimated~~**recommended** safety and security zone through prior trip planning or small course adjustments and that the area would not sustain any negative economic impact. It is highly unlikely that given the large amount of ocean area available for recreation that the Project would result in any impact on participation rates and associated spending levels.

#### **Impact of ~~Estimated~~**Recommended** Safety and Security Zone**

There are approximately 844,800 total acres in Long Island Sound (Long Island Sound Study 2006). Assuming 20% of this total area is removed because it is not suitable for recreational boating due to the proximity to shore, depth of water, or other obstructions, 675,840 acres of adequate boating water still remains. The percent total of the ~~estimated~~**recommended** safety and security zone compared with the total adequate boating area of Long Island Sound are presented in Table F-4-11 below.

**Table F-4-11 Percentage of Navigable Water in**

### Long Island Sound

<u>Recommended Security Zone</u>	<u>AereAcres in Zone</u>	<u>% of Total Long Island Sound</u>
1,0001,210 yard buffer	594949.7	0.070.11%

The recommended safety and security zone area that would potentially be off limits to recreational boating represents a minute portion of the total usable navigable water in Long Island Sound.

Besides sailing regattas, recreational boaters typically do not follow a specific course and would be able to alter their heading to avoid the FSRU and any U.S. Coast-Guard established safety and security zone, without significantly or adversely impacting their trip. With respect to regattas where the course would potentially pass in the vicinity of the recommended safety and security zone, there is ample room for the regattas to make minor adjustments to courses, if necessary, to avoid the proposed FSRU location. ~~Thus, the~~ The WSR also states that, in general, the majority of recreational boating occurs within 3 miles of shore. WSR § 2.2.3.1. Thus, the recommended safety and security zone should not inhibit any regattas in Long Island Sound from being held.

Some recreational boaters may choose to avoid the area surrounding the FSRU completely. It is assumed that due to the potential site of the FSRU in the middle of the Long Island Sound and the closest coast being approximately nine miles away at its closest point, recreational boaters that would prefer to avoid the FSRU have the ability to do so (i.e., the FSRU is not located directly off-shore from a port where recreational boaters would have no choice but to pass close to the FSRU and the recommended safety and security zone).

The number of recreational boaters that would choose to not boat on the Long Island Sound due to the Broadwater Project, by either moving to another body of water or not boating completely, is assumed to be virtually zero and therefore there is not anticipated to be any impact on this form of economic activity.

#### 4.4.3 Sport Fishing

As discussed in Section 4.4.2 – Recreational Boating, the proposed FSRU and the associated safety and security zone would only occupy a small portion of the LIS. Table F-4-11

shows a breakdown in acres of the LIS waters that would no longer be accessible to anglers for sport fishing.

Sport fishing participation rates have been decreasing since 1994 according to the 2001 NY Sea Grant. With this decrease in the overall number of anglers, the conclusion could be drawn that there has been an overall decrease in competition for fishing areas in LIS. Thus, sport anglers would likely be able to find adequate fishing locations in LIS outside of the **recommended** safety and security zone ~~that would be~~ associated with the FSRU.

The Stratford Shoal area, which is a popular fishing location and has high fisherman boat traffic as noted in the Boat Traffic Survey, is an estimated 12 miles away from the proposed FSRU location. There would be no conflict between sport fishing in the Stratford Shoal area.

## **5.0 VESSEL TRAFFIC AND LIS DEPENDENT COMMERCIAL ACTIVITY**

This section provides additional detail on the economic activity that is dependent on LIS for navigation to reach key coastal zone markets. This section also provides background details on the economic importance of waterborne commerce that would navigate around the proposed Project and—provides an assessment of the Project's potential impact on this commercial activity.

While the following information shows that waterborne LIS trade flows can be expected to increase over the next 30 years, the increase in traffic is compatible with other LIS commercial and non-commercial activities including the Broadwater Project.

The Project is not expected to have any adverse economic impact on the future volume of waterborne commerce. The proposed Project's imported volume of energy would be consistent with current bulk movements of energy products that are conveyed to coastal zone markets on LIS by marine mode. The type of bulk freight transiting the Sound is not time sensitive and mostly supports economic activity in the non-manufacturing or service sectors of the regional economy. Even with the increased future volume of freight, siting of the Project away from the main north/south commercial shipping lanes makes any adverse economic impact on waterborne commerce unlikely.

Movements of freight running east to west and vice versa are also unlikely to be in conflict with the location of the FSRU. The results of the Boat Traffic Survey revealed only a few commercial barge vessels at distances far enough away from the Project footprint indicating that historic shipping lanes for commercial freight would not be in conflict with the proposed Broadwater FSRU location. The frequency of commercial barge traffic and distance from the FSRU demonstrates that there would be sufficient navigational leeway, even with the recommended safety and security zone, to avoid any adverse impact on vessel transit times and economic activity.

### **5.1 Background Economic Activity and Navigation Dependent Industries**

The Long Island Sound Waterborne Transportation Plan (LISWTP) was recently completed for the New York Metropolitan Transportation Council, the Greater Bridgeport Regional Planning Agency and the South Western Regional Planning Agency (LISWTP,



November 2005). One of the goals of the plan was to identify how effective use of the Sound for marine transportation of both freight and people could relieve congestion on coastal zone road networks.<sup>1</sup> The forward looking plan, out to 2025, is relevant to the coastal zone impact analysis conducted for the Broadwater Project because it evaluated movements of freight and people that are potentially susceptible to being diverted to marine service modes.

The LISWTP contains data on the baseline and projected volume of waterborne trade flows in tons for the LIS market areas proximate to the proposed Project. The market areas consisted of LIS based coastal zone communities running the entire length of Long Island Sound and the relevant portion of the Connecticut LIS shoreline. Select data and figures that are relevant to the Broadwater Project are reproduced below from the LISWTP as background and to provide context for the coastal zone economic activity.

In 2000, approximately 312 million tons of goods valued at \$798 billion dollars moved through the Long Island Sound region. This region is comprised of all major ports within the coastal zone and includes the Port Authority of New York and New Jersey.

While most of the freight movements are by truck (244 mil. annual tons/78.3%), a significant portion of the commodity freight moved in the region is by water (62 mil. tons/20%). The remaining portion of freight (5.7 mil. tons/1.8%) is moved by other modes.

Table F-5-1 shows the direction of freight movements in tons for the Long Island Sound region. More goods enter the region and are consumed within the relevant coastal markets than goods that are exported. The waterborne freight mostly supports the service-based economy of the region. Freight passing through or transiting the region accounted for 17% of the total flow of goods in 2000 (LISWTP, 2005).

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<sup>1</sup> See [http://www.nymtc.org/project/LISWTP\\_final/documents/TOC.pdf](http://www.nymtc.org/project/LISWTP_final/documents/TOC.pdf)

**Table F-5-1 Long Island Sound Region-Breakdown of Goods Movement by Type (million tons)**

Direction	2000	%
Inbound	152.8	40.9%
Outbound	111.5	29.8%
Internal	47.1	12.6%
Through	62.2	16.6%
Total:	373.6	100.0%

Source: LISWTP

The most important commodities that move by water are generally heavy low value bulk freight commodities. The top commodities by industry class include energy (petroleum or coal products), building supplies, consumer goods and food, followed by chemical and allied products. These top five commodity groups represent 72% of all tonnage moved in the region. Petroleum and coal products make effective use of the marine transportation network. Barges carrying these commodities are a common everyday site on the North Shore of LIS. Table F-5-2 shows the top five regional commodities, in annual tons, by mode for 2000.

**Table F-5-2 Long Island Sound Region - Top Five Regional Commodities by Mode, 2000 Annual tons in millions**

Commodity	Other	Marine	Truck	Total:
Petroleum or Coal Products	0.0	46.6	21.6	68.2
Clay, Concrete, Glass or Stone Products	0.2	1.2	45.2	46.6
Warehouse and Distribution Center	0.0	0.0	44.1	44.1
Food or Kindred Products	0.6	0.1	37.9	38.6
Chemicals or Allied Products	0.5	1.1	15.6	17.2
<b>Total:</b>	<b>1.3</b>	<b>49.0</b>	<b>164.4</b>	<b>214.7</b>
<b>Share of Mode in Percent (%)</b>				
Petroleum or Coal Products	0%	95%	13%	32%
Clay, Concrete, Glass or Stone Products	15%	2%	27%	22%
Warehouse and Distribution Center	0%	0%	27%	21%
Food or Kindred Products	46%	0%	23%	18%
Chemicals or Allied Products	38%	2%	9%	8%
<b>Total:</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: LISWTP

Petroleum and coal products are the most important commodity moved by barge or other vessel type within the Long Island Sound region. Petroleum and coal products accounted for 22% of the total top five commodity freight categories and 95% of the top five commodity tons moved by marine mode.

The LISWTP anticipates that the total volume of goods moving through the Long Island Sound study area will grow from 311.5 tons in 2000 to 528 million annual tons by 2025. This growth in total freight volume represents a 69.5% increase between these years. To estimate the projected order of magnitude freight volume by mode, this growth rate was applied to the 2000 total annual ton levels shown in Table F-5-2 to provide an indication of the future amount of marine commercial activity that will coincide with the operation of the Broadwater Project. Table F-5-3 shows the projected tonnage that can be expected, if the growth rate is realized.

**Table F-5-3 Top Five Regional Commodities by Mode, 2025<sup>2</sup>**

Commodity	Other	Marine	Truck	Total:
Petroleum or Coal Products	0.0	79.0	36.6	115.6
Clay, Concrete, Glass or Stone Products	0.3	2.0	76.6	79.0
Warehouse and Distribution Center	0.0	0.0	74.7	74.7
Food or Kindred Products	1.0	0.2	64.2	65.4
Chemicals or Allied Products	0.8	1.9	26.4	29.2
<b>Total:</b>	2.2	83.1	278.7	363.9
<b>Share of Mode in Percent (%)</b>				
Petroleum or Coal Products	0%	95%	13%	32%
Clay, Concrete, Glass or Stone Products	15%	2%	27%	22%
Warehouse and Distribution Center	0%	0%	27%	21%
Food or Kindred Products	46%	0%	23%	18%
Chemicals or Allied Products	38%	2%	9%	8%
<b>Total:</b>	100%	100%	100%	100%

Given that the purpose of the LISWTP is to identify how effective use of the Sound for marine transportation of both freight and people could relieve congestion on coastal zone road networks, it is entirely possible that additional freight will be diverted to marine modes over the projection horizon. The projected shares of total freight for the top five commodities shown in Table F-5-3 reflect the baseline 2000 level, but these can reasonably be expected to change.

It should be noted that the energy equivalent imports to be provided by the Broadwater Project would be equivalent to 7.7 million tonnes (metric) per annum from 2010-2040. These volumes are consistent with the growth in commercial activity that is contemplated by the LISWTP. The importation and transmission of this amount of energy through a subsea pipeline would be a far less intrusive way of delivering this energy to coastal zone end-users, compared to using more barges and vessels to deliver petroleum and coal products. Therefore,



from a coastal zone consistency framework, the Broadwater Energy imports represent a relatively low impact, more efficient form of delivering this energy to end users, compared to introducing greater amounts of marine traffic. But for the proposed Project, including, the subsea pipeline extension, more vessels and barges would be required to satisfy future energy demand.

Furthermore, given the intent of the LISWTP to divert truck and other freight from congested coastal zone road networks to LIS marine modes to reach end markets, the existence of the subsea pipeline would serve to mitigate impacts associated with an equivalent amount of energy related barge traffic,

## **5.2 Vessel/Freight Transit Patterns**

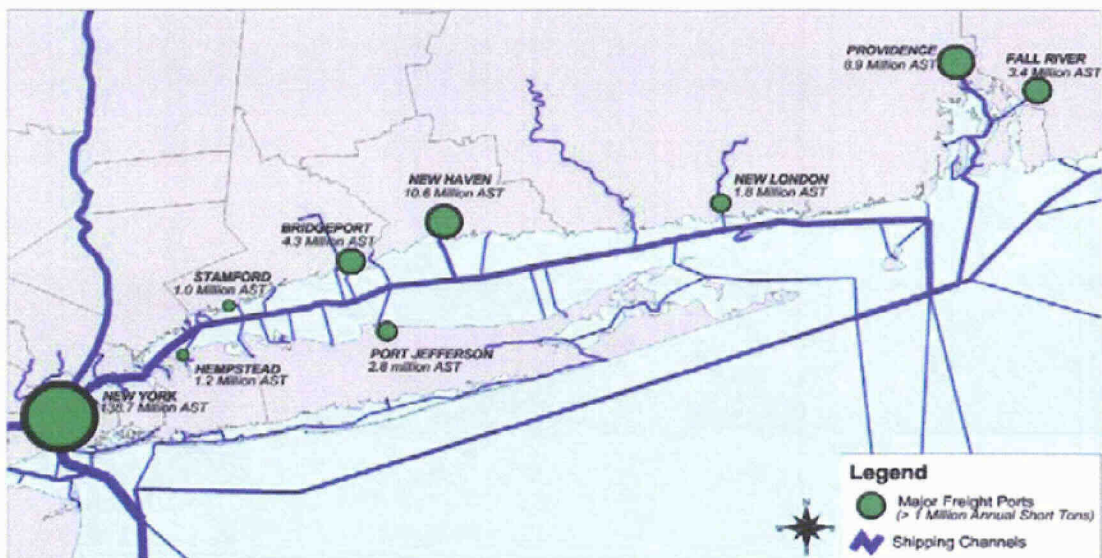
Figures 5-1 and 5-2 are reproduced from the LISWTP below to illustrate the flow of freight volume transiting the LIS between the major ports that are proximate to the proposed Project location.

Figure 5-1 shows the major coastal zone ports and their annual total of tons of freight for 2000. The main shipping channels are also displayed. The shipping channel lines show the relative volume of freight transiting the region. In terms of annual tons of freight, the region is still dominated by the Port of New York and New Jersey followed by New Haven and Bridgeport.

Figures 5-2 and 5-3 summarize freight flows in the LIS region by market type or endpoint for both 2000 and 2025. The green lines signify trade flows that pass through the region without stopping and end up elsewhere along the eastern seaboard.

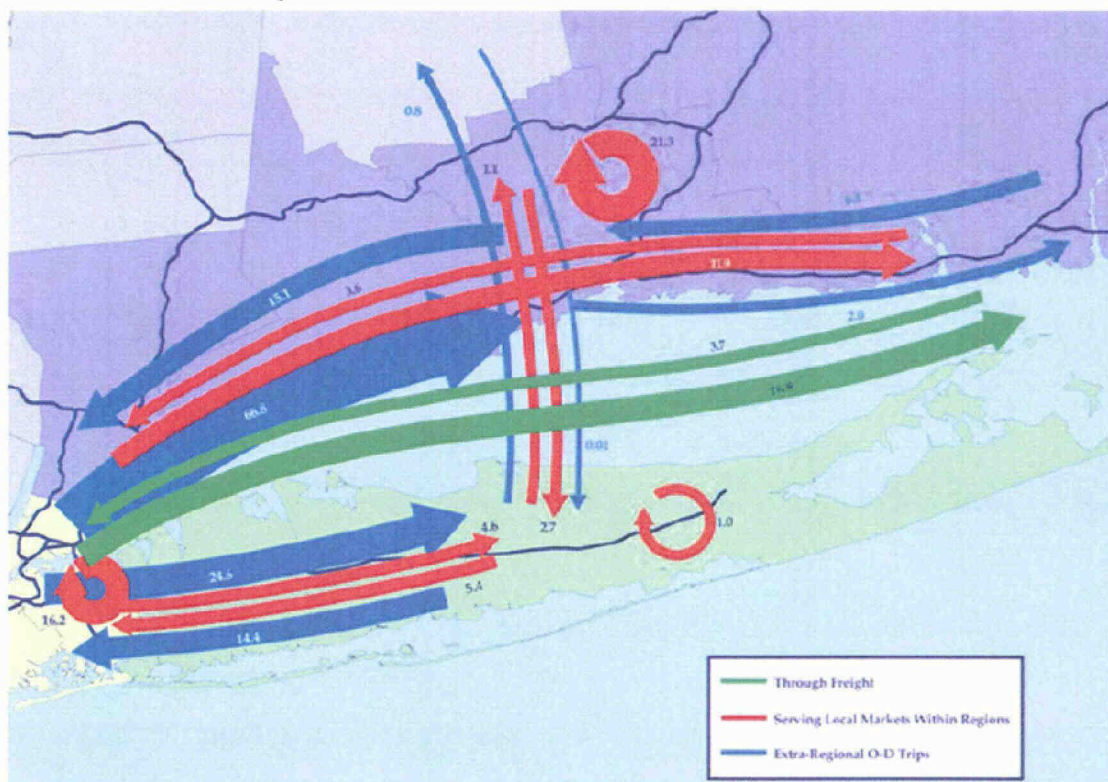
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<sup>2</sup> Extrapolation Using Total Projected Tonnage Growth Rates and 2000 Modal Shares Annual Tons in Millions



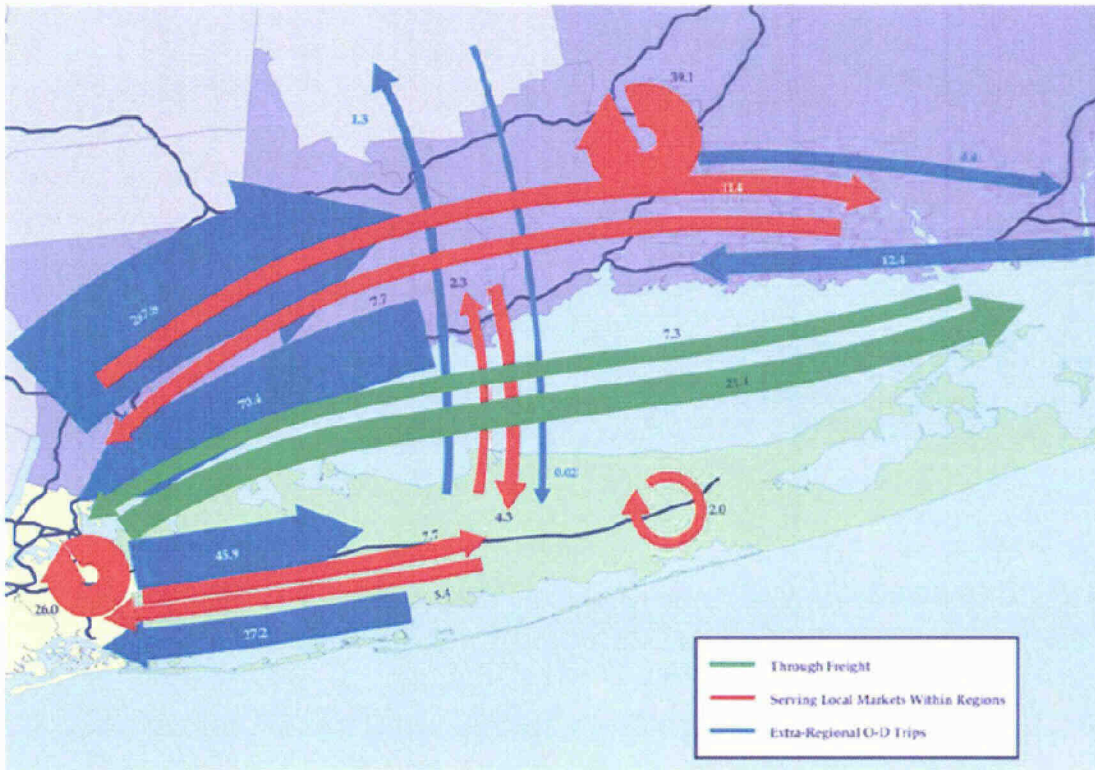
Source: LISWTP

**Figure 5-1** Port Commerce Around Long Island Sound 2000



Source: LISWTP

**Figure 5-2** Summary of Annual Freight Flows, 2000 (million of annual tons)



Source: LISWTP

**Figure 5-3 Summary of Forecasted 2025 Freight Flows (million of annual tons)**

The red lines indicate flows that move freight to end markets between two LIS area ports and originate within the region. The flows marked in blue lines are flows that originate outside of the LIS region and end up at another sub-region market.

The red line flows are relevant because they reflect an evaluation of commodities that could be diverted in the future to marine modes or ferry service that would bypass more lengthy land routes. The proportional tonnage lines shown in the figures above relate to the relative proportion of baseline and projected tons of freight moved, and should not be confused with the physical width or dimensions of the shipping lanes. The figures imply that more trips/vessels would transit LIS in the future to support this freight tonnage and the expected growth in economic activity.

### 5.2.1 Potential Economic Impact from Broadwater Project

Table F-5-2 shows that annually, about 47 million tons of petroleum and coal products are moved by barge or other vessel type annually to reach LIS coastal zone markets. The Broadwater Project's annual energy importation would be equivalent to 7.7 million tonnes

(metric) per year of liquefied natural gas (LNG). This comparison shows that the Project's energy imports would be entirely compatible with both the current and planned for uses of the Sound that were contemplated within the LISWTP. The Project's proposed energy tonnage would also provide coastal zone consumers with an option to migrate from petroleum and coal to cleaner burning natural gas.

The Broadwater FSRU location and surrounding safety and security area will be incorporated into marine navigational charts, illuminated at night, and the FSRU safety and security zone will be marked by buoys. The location of the FSRU and recommended safety and security zone footprint is not large enough to result in an economic impact based on the potential interruption or delay in transiting vessels.

While some transiting vessels may need to navigate around this location, there is sufficient room within the established shipping routes to easily accommodate these changes without imposing additional operating costs to commercial vessel operators. Historically, commercial vessels and navigators have become familiar with noteworthy parts of Long Island Sound such as shoals and the Race narrows and have historically adjusted and adapted their behavior without incurring any disruptions to economic activity.

Furthermore, as the LISWTP indicated, most waterborne freight, consisting of heavy bulk commodities, is not time sensitive or tied to just-in-time inventory schedules as the freight mostly serves service sectors of the regional economy and not manufacturing. This fact suggests that the possibility of any minor delay to shipping traffic resulting from FSRU operations would not have a negative economic impact on these sectors.

It is reasonable to expect that once Broadwater terminal operations commence navigators would become familiar with the Project footprint and adjust their behavior to work with and around this site location. The East to West and West to East commercial freight traffic has adapted to North – South/South North ferry transits without any interruptions to economic activity. Similarly, the LNG vessel transits to and from the FSRU would be incorporated into existing commercial vessel flow patterns without incurring any impacts to economic activity.

The boat survey performed by Broadwater Energy indicated that large commercial vessels were primarily observed traveling east-west using established shipping



~~lanes/routes~~ to the north and south of the FSRU and consequently would not be significantly impacted by the current siting location of the FSRU.

Furthermore, the scheduling of LNG carrier arrivals will take into account the use of the area by other marine traffic and will require close cooperation between Broadwater Energy, the U.S. Coast Guard, and other operators to ensure impacts on other users of the Sound are minimized. An LNG carrier traversing the Race and the Sound will ~~likely~~ be surrounded by a traveling U.S. Coast Guard-imposed safety and security zone, ~~which may limit use of the area adjacent to the~~. **The recommended zone would extend 2 nautical miles ahead, 1 nautical mile astern, and 750 yards on each side of the LNG carrier.** It is also important to note that based on the anticipated carrier speed of 12 knots, the approximate duration of a traveling safety and security zone at any single point would be approximately 15 minutes. ~~Based on a review of existing NOAA charts, the transiting LNG carrier would not prevent commercial or non-commercial traffic from transiting the Race~~ **As confirmed in the WSR recently issued by the U.S. Coast Guard for the Project, the effects of the moving safety and security zone around the LNG carriers on other waterway users in the Race could be managed.**

### **5.3—Long Island Tourism**

Information on Long Island Sound-based recreational activity was covered under Section 4.0. This section provides additional background information and economic data related to the tourism industries that support both offshore and land based recreational activities and attractions for out of town visitors.

The tourism “industry” can be comprised of firms that fall mostly within the retail trade sectors. Environmental and natural resource-based amenities on Long Island serve to attract visitors from outside the region who then spend money on goods and services within Suffolk and Nassau Counties. The tourism spending is amplified by overnight stays and attractions and visits that require overnight lengths of stays.

The region possesses a tourist infrastructure comprised of hotels/motels/bed & breakfasts and Inn and restaurants and other support services that cater to tourists. An area’s historic character or market “branding” can define the resources that attract tourists. Out of town visitors bring in new or imported dollars to a region and their spending contributes to economic growth in a region and supports other dependent industries and households. Eastern Long Island

has always attracted visitors from the NYC metro area who view the less developed parts of the Island as a weekend or even day retreat or getaway destination.

Industrial and commercial activities that are considered low impact or benign serve to leave the region's particular "brand" untarnished. This is because these activities are not located in high profile areas that serve to attract out of town visitors.

### **5.3 Background Activity**

It is estimated that the 20 New York State-managed parks and historic sites (along with other locally run municipal parks) on Long Island attract nearly 20 million visitors annually. Many of these sites are located in Nassau County, close to New York City, or on the far eastern end of Long Island (New York State Office of Parks 2006). The attractions on Long Island are the coastal areas and bays for swimming, fishing, boating and other beach recreational activities, in addition to golf destinations, wine tours, inland hiking, biking and camping, and general sightseeing tours.

Specific popular attractions in Suffolk County, NY, include the Vanderbilt Museum, Walt Whitman Historic Site and the Stony Brook Grist Mill in the "North Shore" area. Central Suffolk County attractions include a top-rated water park, Splish Splash, and the Atlantis Marine World aquarium in Riverhead, NY. In eastern Long Island the two "forks" each offer unique attractions. North Fork is more rural, with vineyards, farm stands and smaller villages. South Fork is the location of the more exclusive Hamptons, which includes upscale dining and shopping (LICVB 2006).

The Long Island wine industry is a growing tourist destination that has received significant attention and funds over the past decade. There are 38 licensed wine producers on Long Island, 33 of which are located on the North Fork (30 on LI and 26 on North Fork are open to the public). It is estimated that there are approximately 500,000 visitors to the East End wineries annually (Long Island Wine Country 2006).

Access to Long Island can also be gained through use of buses, trains, ferries or personal vehicles or plane. Airports generally serving tourists coming to Long Island include the following:



JFK International Airport	LaGuardia Airport
Brookhaven Airport	Republic Airport Farmingdale
Lufker Airport East Moriches	East Hampton Airport
Islip Airport	Mattituck Airport
Francis S. Gabreski Airport Westhampton	Montauk Airport
Long Island MacArthur Airport	
Source: Long Island Browser 2006	

Tourism-related employment figures for NYS and Long Island (Nassau and Suffolk Counties) are presented in Table F-6-1. As indicated in the table notes, the tourism-related employment data is estimated from a "Travel & Tourism Cluster" of industries, which are then prorated based on assumptions of purchases and spending directly related to tourists (not residents). Thus, the figure of 38,130 pro-rated 2004 Long Island employment is representative of jobs that cater directly to non-resident, out-of-town tourists visiting local attractions.

**Table F-6-1 Tourism Related Employment and Wages for New York State and Long Island (2004)**

	Pro-Rated Employment	Pro-Rated Total Wages	Average Wages
New York State	333,530	\$10,818,540	\$32,400
Long Island	38,130	\$1,105,120	\$29,000
Nassau	19,380	\$581,191	\$30,000
Suffolk	18,750	\$523,930	\$27,900

Source: N.Y. State Dept. of Labor 2006

Notes:

1. ESD counts 70 6-digit NAICS-based industries as part of the Travel & Tourism Cluster; this industry list is further broken down into 5 sub-clusters including: 1) Travel Retail; 2) Passenger Transportation; 3) Culture, Recreation and Amusements; 4) Accommodations; and 5) Food Services.
2. As it has for the past few years, ESD pro-rates industry employment and wages data by only counting that share of employment and wages in an industry attributable to purchases made by tourists. Share estimates were developed by the BEA (For example, according to the BEA, approximately 20 percent of all food and beverage purchases are made by visitors, while the remaining 80 percent are made by local residents.)
3. Pro-rated County and regional travel & tourism employment and wages data for 2004 are attached. Also included is a list of tourism industries and their respective pro-ratio shares.

Although tourism is a major industry in Long Island, generating an estimated \$65 million in annual sales, it is not a major source of employment in Nassau and Suffolk Counties.

#### **5.4 Potential Economic Impact from the Broadwater Project**

Negative impact to historic tourism levels and associated spending from the proposed Project is not expected. The Project will not affect the Long Island area's natural resources and amenities that serve to attract tourists. The Project will be sited at a significant

distance from any coastal areas that would attract tourism. In addition, land-based activities to support Broadwater will be small and low impact in scope. Therefore, the Broadwater Project is not expected to have any adverse effect on the regional “branding” that defines the tourist experience on Long Island, and the level of spending that is derived from tourism is not anticipated to be negatively affected by the Project.

It would take a significant, protracted change in commercial and industrial activity and development to affect the particular “brand” that defines Eastern Long Island. Open spaces and access to water are amenities that “brand” this part of Long Island.

The marketing appeal and branding for a sub-area such as a wine country area will not be impacted by offshore commerce. In addition, ecologically fragile areas that function as regional eco-tourist attractions such as the North Fork and the Pine Barrens (*see* Figure 6-1 for geographic reference) would not be impacted by the Project. As long as the resources that attract tourism remain intact, the tourist based economic sectors that depend on this visitation will not be impacted.



Source: The Nature Conservancy, <http://nature.org/wherewework/northamerica/states/newyork/preserves/art10990.html>

**Figure 6-1 Pine Barrens Area of Long Island**

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**REVISED APPENDIX J**

**LNG CARRIER ROUTE ANALYSIS  
APPENDIX A TO RESOURCE REPORT NO. 8**

**~~April~~October 2006**



**APPENDIX A**  
**LNG CARRIER ROUTE ANALYSIS**

In addition to analyzing the onshore coastal regions in the immediate vicinity of the Project, Broadwater also conducted an analysis of major sensitive receptors on the shorelines along the LNG carrier routes entering into Block Island Sound and Long Island Sound from the Atlantic Ocean. The analysis covers shorelines and relevant offshore features from Point Judith, Rhode Island, and Montauk, New York, to the entrance into Long Island Sound at the Race and onwards to the proposed FSRU location. This includes an analysis of the shoreline features of Rhode Island, the far eastern shorelines of New York and Connecticut, and Block Island. To facilitate the discussion of the routing, waypoints have been identified along the route where course changes would likely occur.

**Broadwater's initial analysis in the April 2006 CZCC was based on estimated LNG carrier routes from U.S. territorial border south (Southern Route) or southeast (Northern Route) of Block Island approaching Long Island Sound. Since this analysis was completed, the U.S. Coast Guard (USCG) issued its Waterways Suitability Report (WSR) in September 2006 which included a detailed analysis of specific LNG carrier routing from federal waters to the proposed FSRU which were based on Broadwater's originally proposed routes.**

**While the analysis does differ from the routes analyzed by Broadwater in its April 2006 analysis, the differences are slight and represent minimal changes to the analysis (See Figure A-1). The WSR analysis also includes information on the recommended traveling safety and security zones around LNG carriers transiting to the FSRU. These safety and security zones would extend two nautical miles in front of, one nautical mile behind, and 750 yards to either side of the LNG carrier.**

In general, the analysis indicates **submitted April 2006 does not change based on information from the WSR, indicating** that no major coastal features would be significantly impacted by the proposed LNG carrier or associated USCG-identified safety and security zone that likely will be enforced around the carrier as it transits to the FSRU location. **(See The only exception to this is that Thermal Radiation Hazard Zone 3 (an unignited vapor cloud) could impact land along limited portions of the recommended transit route. Due to the conservative nature of the analysis, however, the potential for Hazard Zone 3 to impact land along the LNG carrier route is highly unlikely. A discussion of Hazard Zone 3 is described in Section 2.2.1 of Broadwater's October 2006 CZCC Supplement. . (See also Resource Report 3 [Fish, Wildlife, and Vegetation] for potential impacts on marine ecological resources.)**

Broadwater is currently engaged in consultation with the USCG concerning the preferred routing that LNG carriers would take to enter and transit Long Island Sound, as well as the requirements for any safety and security zone that would surround the LNG carrier as it made its transit through the Sound.

An LNG carrier will transit to the proposed FSRU on average once every two or three days. Based on preliminary routing, there are two routes that LNG carriers may take when entering Block Island Sound prior to entering Long Island Sound via the Race. These two routes include:

- The Northern Route, which runs between Block Island and Point Judith, Rhode Island; and

- The Southern Route, which enters Block Island Sound via the Montauk Channel.

For both routes, the LNG carriers would be nearest the shoreline as they enter Long Island Sound via the Race.

### **The Northern Route**

The Northern Route is assumed to start at the U.S. territorial border south and east of Block Island and follow a north-northwesterly course to the pilot station located north of Block Island. At this location, the LNG carrier would be approximately 4.3 nautical miles (nm) (5 statute miles) from Point Judith, Rhode Island. Along the remainder of the inbound transit from north of Block Island to the proposed FSRU location the carrier would follow a route that is not less than 3.3 nm (3.8 statute miles) from the shoreline of Rhode Island, Connecticut, or New York.

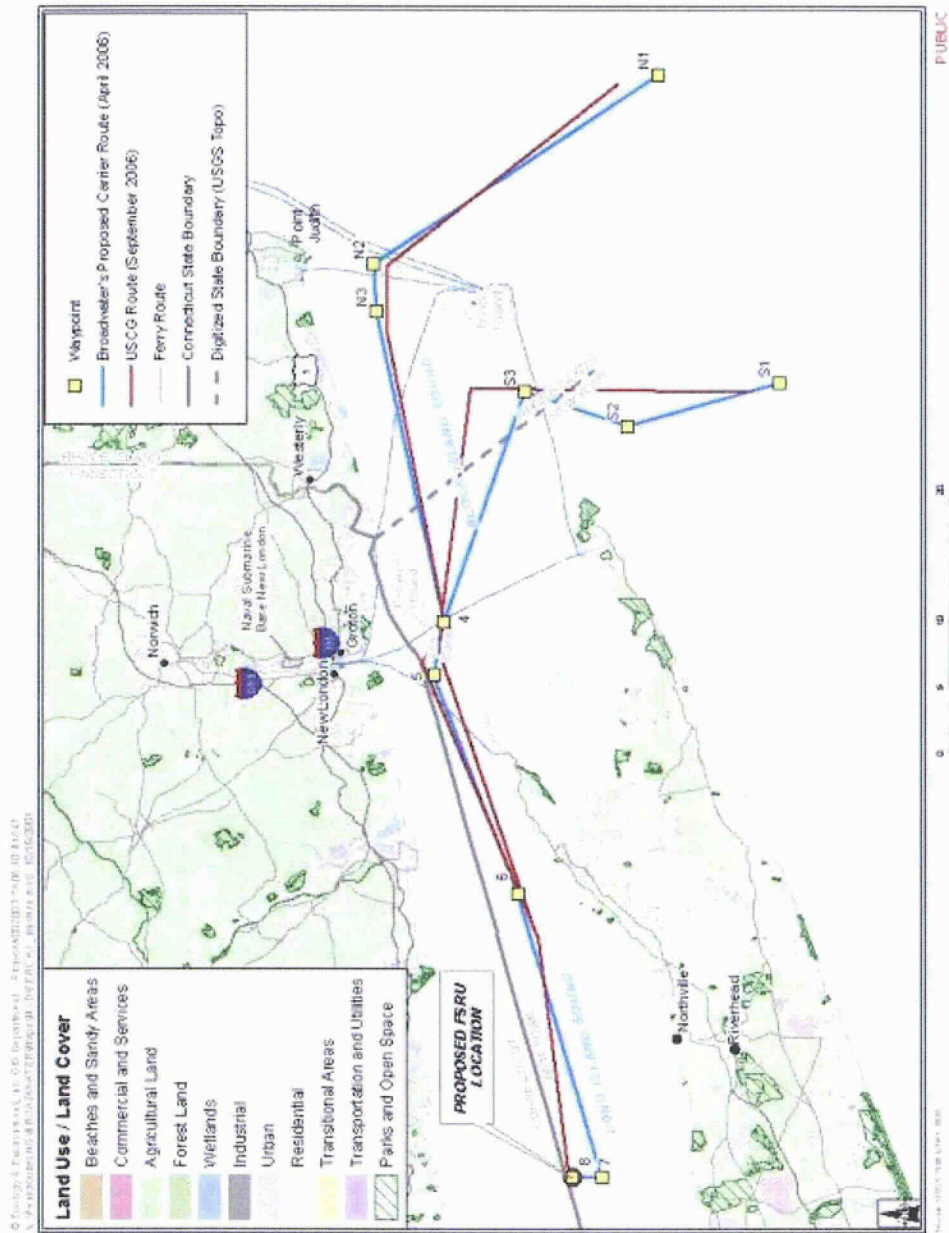
At Waypoint N2, near the Point Judith pilot station, the carrier would begin its westerly course toward the FSRU. Between waypoints N2 and N3 (*see* Figure A-1), the route is approximately half way between Block Island and Point Judith (approximately 4.3 nm [5 statute miles] from the Rhode Island shoreline and 4.8 nm [5.5 statute miles] from Block Island). At Waypoint 4 the LNG carrier would traverse south of Fishers Island (*see* Figure A-1). Between waypoints 4 and 5 at the Race, the LNG carrier would pass between Fishers Island and Valiant Rock and make its closest approach to land. At the closes point, an LNG carrier would be within 1 nm (1.2 statute miles) of Fishers Island. At Waypoint 5, prior to heading southwest toward the FSRU, the LNG carrier would be at its closest approach to Connecticut, approximately 3.3 nm (3.8 statute miles) from the Connecticut shoreline. From Waypoint 5, the LNG carrier would then head west, paralleling the Long Island shoreline until it connects with the FSRU at its proposed location in the Town of Riverhead, Suffolk County, New York.

The Northern Route is approximately 87 nm (100 statute miles) in length, and water depths exceed 100 feet (30.5 m) for the majority of the route.

### **Southern Route**

Arriving LNG carriers would approach the Southern Route from a northerly course beginning at the U.S. territorial border (*see* Figure A-1), on a heading toward the Montauk pilot station near Waypoint S2. Between waypoints S2 and S3, the LNG carrier would enter the Montauk Channel east of Montauk Point. At this location the LNG carrier route is approximately 6.1 nm (7 statute miles) from Montauk Point. The sea bottom in this channel is shallow, with depths ranging from 50 to 60 feet (15.2 m to 18.3 m) and shallow spots with depths down to 41 feet (12.5 m). After passing through the Montauk Channel, the depth increases to over 100 feet (30.5 m). At Waypoint S3, the route is approximately ~~3.9~~3.9 nm (4.5 statue miles) from Block Island. From the Montauk Channel the route heads in a northwesterly direction (generally between waypoints S3 and 3) toward Fishers Island. Between waypoints 4 and 5, the LNG carrier would traverse in a west-northwesterly direction to south of Fishers Island. Thereafter, the route is the same as described for the Northern Route. The length of this leg is approximately 78 nm (90 statute miles).

Scheduling arrivals will take into account use of the area by other marine traffic and will require close cooperation between Broadwater, the USCG, pilots, and other operators (*see* Resource Report 11, Safety and Reliability). Scheduling of LNG carrier arrivals is a very important issue for ~~Broadway~~Broadwater with respect to limiting impacts on other users of the Sound because a traveling, USGC-imposed safety and security zone will likely be enforced around the LNG carrier, which may limit use of the area adjacent to the carrier. Based on an anticipated carrier speed of 12 knots, the approximate duration of a traveling safety and security zone at any single point would be only approximately 15 minutes. Based on review of existing NOAA charts, the transiting LNG carrier would not result in any bottlenecks that would prevent other commercial or recreational traffic from transiting the Race.



In general, onshore/coastal land uses along the assumed LNG carrier routes do not differ substantially along the New York, Connecticut, or Rhode Island shorelines (*see* Figure A-1). The majority of the coastal land uses along these shorelines are a mix of forested and agricultural land, with some residential uses interspersed within this overall pattern. In addition, the overall population densities encountered along these routes are fairly consistent for all three states, with a majority of population densities ranging from 0 to 500 people per square mile (*see* Figure A-2). The exception of this is the coastal area round New London, Connecticut, and Westerly, Rhode Island, where densities increase substantially. As shown on Figure A-2, population densities in this area can exceed 3,000 people per square mile. Near New London and Westerly, however, it is expected that the LNG carrier would be a minimum of 4.3 to 6.1 nm (5 to 7 statute miles) from the Rhode Island/Connecticut shoreline.

The LNG carrier's closest approach to inhabited land would be 1.2 nm (1.4 statute miles) as it transits south of ~~3,200~~**3,200**-acre Fishers Island. This 7-mile-long, 0.75-mile-wide island is located about 10.4 nm (12 statute miles) northeast of Orient Point, New York, and 3.5nm (4 statute miles) south of Connecticut. Fishers Island has a permanent population of 269 people. The island is accessible only by boat or plane and is characterized as a high-end residential resort community with a small village, residential homes, and recreational amenities such as golf courses and resorts.

Montauk Point State Park is the largest coastal park occurring along the LNG carrier routes. The park, situated on the eastern tip of Long Island near the historic Montauk Lighthouse, is primarily forested. At its closest approach, the LNG carrier would be approximately 6.1 nm (7 statute miles) from Montauk Point. However, because of its topography the park offers wide-open, unobstructed views of the water at various points, and the LNG carrier may be visible from these locations. Because of the number of larger commercial vessels that currently utilize the Sound, users of this park are accustomed to offshore vessel traffic and will not be adversely impacted.

In addition, several smaller parks and open-space areas are located on the Connecticut shorelines; however, at its closest approach the LNG carrier would be over 3.5 nm (4 statute miles) from these coastal parks. As with Montauk Point State Park, users of these parks are accustomed to large commercial vessel traffic on the Sound and will not be impacted.

**The Coast Guard's assessment leads it to the conclusion that no land areas along the LNG carrier transit route would fall within Hazard Zones 1 or 2. WSR §3.2.**

**Hazard Zone 3, which carries the least level of risk and conservatively extends out to 4.3 miles from the moving LNG carrier, would overlap the following land areas:**

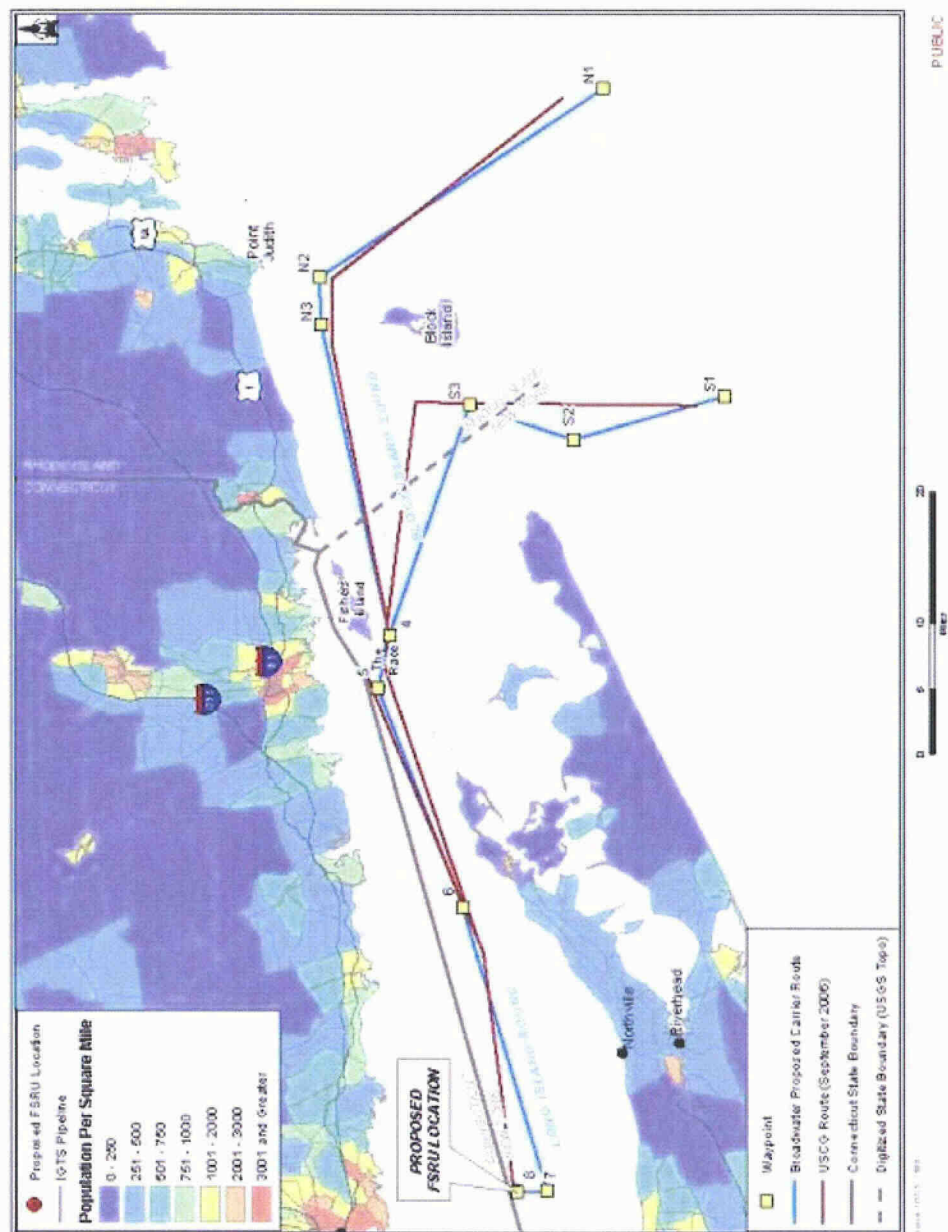
- **Northern tip of Block Island, Rhode Island;**
- **Southern tip of Weekapaug Point, Westerly, Rhode Island;**
- **Southern tip of Watch Hill, Rhode Island;**
- **All of Fisher's Island, New York;**
- **All of Plum Island, New York;**



- Northernmost third of the North Ford of eastern Long Island; and
- A portion of Goshen Point straddling the City of New London and the town of Waterford.

In addition to traversing along coastal areas, the LNG carrier would also cross several existing ferry routes, specifically the Montauk-to-Block Island High Speed Ferry and the New London-to-Orient Point ferry routes. Potentially impacted ferry services and routes are discussed in more detail in Resource Report 8, Land Use, Aesthetics, and Recreation.

As mentioned previously, a discussion of impacts on marine ecological resources is provided in Resource Report 3, Fish, Wildlife, and Vegetation.



**Figure A-2 Population Densities in the Vicinity of the Proposed LNG Carrier Routes**

## 4.0 Consistency With New York State's Coastal Management Program

New York State's Coastal Management Program (State CMP) consists of 44 policies that are designed to ensure the appropriate use of the coastal zone, which is defined as within up to 1,000 feet of the waterfront. A project applicant must make an initial showing of consistency with each of the 44 policies of the State CMP. The applicant's determination is then subject to either a concurrence or objection by the New York State Department of State (NYSDOS).

New York has also developed and approved a separate and distinct coastal management program for Long Island Sound. The Long Island Sound Coastal Management Program (LIS CMP) "refines" the state CMP and incorporates programs and laws governing coastal activities within Long Island Sound. The LIS CMP generally replaces the State CMP for the Sound shorelines of Westchester County, New York City to the Throgs Neck Bridge, Nassau County, and Suffolk County. Thus, the LIS CMP sets the parameters for evaluating the consistency of a project -- such as Broadwater -- that is proposed for Long Island Sound unless there is an approved Local Waterfront Revitalization Program ("LWRP"), in which instance, the LWRP primarily applies.

The LIS CMP identifies four distinct and interrelated coasts -- the developed coast, the natural coast, the public coast, and the working coast -- and establishes "specially tailored standards that define what constitutes a balance between appropriate and needed economic development and protection and restoration of the natural and living resources of the Sound." (LIS CMP, Introduction at 1, 3). Broadwater addresses each of the 13 specific policies of the Long Island Sound Coastal Management Program under this analytical rubric below. Broadwater also addresses the approved LWRPs<sup>1</sup> from Southold, Greenport, Smithtown and Lloyd Harbor.<sup>2</sup> As part of its CMP analysis, Broadwater addresses the Port Jefferson Harbor

<sup>1</sup> Broadwater respectfully submits that its analysis of the Broadwater Project's consistency with the policies and/or objectives of DOS- and federally approved programs and plans under the state CMP, including LWRPs and Harbor Management Plans (HMPs), is subject to and without waiver of any rights that Broadwater has or may have regarding the applicability or non-applicability of such LWRPs and/or HMPs with regard to part or all of the Broadwater Project.

<sup>2</sup> Broadwater's analysis of the Village of Lloyd Harbor LWRP is incorporated into Broadwater's analysis of the 44 policies of the State CMP because the Lloyd Harbor LWRP draws upon those policies. The Village of Lloyd Harbor is more than 30 miles from the location of the proposed FSRU and will be screened from the Broadwater Project by intervening landforms. Because the Broadwater Project will not be visible from Lloyd Harbor and does not otherwise impact Lloyd Harbor or its LWRP, Broadwater respectfully submits that a separate analysis of the Broadwater Project's consistency with the Lloyd Harbor LWRP would be substantially duplicative of Broadwater's state CMP analysis. To the extent, however, that NYSDOS advises Broadwater otherwise as to Lloyd Harbor or any other potentially applicable and enforceable LWRP or other program, Broadwater reserves the right to submit additional information, and the level of such information in this submission shall not be deemed a waiver of or prejudice to Broadwater's right to submit such additional information. Also, and in accordance with the directives of the NYSDOS, Broadwater does not address LWRPs that have not yet been DOS- and federally-approved, but which, if approved, would be potentially enforceable as to the Broadwater Project, including those draft LWRPs for the Town of Riverhead and the Village of Port Jefferson. As of the date of this submission, neither the Port Jefferson nor Riverhead LWRPs have been approved by DOS.

Complex Harbor Management Plan and the Long Island North Shore Heritage Area Management Plan. Last, Broadwater analyzes the policies of the State CMP to demonstrate the Project's conformance with each of the 44 policies that may apply where the LIS CMP, LWRPs, or other aspects of New York's coastal management program do or may not apply.

#### **4.1 Policies of the Long Island Sound Coastal Management Program**

**POLICY 1:** *Foster a pattern of development in the Long Island Sound coastal area that enhances community character and preserves open space, makes efficient use of infrastructure, makes beneficial use of coastal location, and minimizes adverse effects of development.*

- 1.1 *Concentrate development and redevelopment in or adjacent to traditional waterfront communities.*
- 1.2 *Ensure that development or uses take appropriate advantage of their coastal location.*
- 1.3 *Protect stable residential areas.*
- 1.4 *Maintain and enhance natural areas, recreation, open space and agricultural lands.*
- 1.5 *Minimize adverse impacts of new development and redevelopment.*

The Broadwater Project is consistent with and furthers the objectives of LIS CMP Policy 1 because it will introduce a reliable supply of new natural gas to the region, satisfying a manifest need for additional, cleaner-burning energy sources that are required to promote patterns of development that will protect and enhance the character of Long Island's coastal communities. The Broadwater Project offers a compelling solution to the ever-growing demands in the Long Island, New York City, greater New York City metropolitan, and Southern Connecticut markets for a competitively-priced, reliable, and cleaner-burning fuel supply. This supply, which will be used by the residences and businesses, municipal governments, commerce, schools, and hospitals in the target markets, will also enable existing coal- and oil-fired electric generating facilities to repower using clean-burning and cost-effective natural gas. The end result will be increased energy reliability and regional power generation, and reduced impacts on the natural resources that so greatly contribute to the character of Long Island's coastal communities.

Simply put, Broadwater's introduction of a new, reliable natural gas supply will sustain and promote growth that is consistent with the objectives of enhancing community character, preserving open space, maximizing use of infrastructure, and minimizing adverse effects of development. In addition, the Broadwater Project itself -- its design, location, and operations -- will be consistent with these objectives. For all of the reasons fully set forth herein, the Broadwater Project is consistent with LIS CMP Policy 1.

#### ***The Manifest Need for the Broadwater Project***

There is an undeniable need for the availability of a new fuel supply into the regional market in and around the Long Island Sound. Broadwater's introduction of a new gas supply into this regional market will encourage patterns of development that will protect and

enhance the character of Long Island's coastal communities. For example, the Long Island, New York City, and Southern Connecticut regions combined presently consume approximately 20 percent of the total gas consumption of the Northeastern U.S. and Eastern Canada ("NEEC") markets -- an estimated 700 billion cubic feet (bcf)/year. Average daily demand in Long Island, New York City, the greater New York City metropolitan area, and Southern Connecticut is anticipated to grow from 1.8 billion cubic feet per day (bcfd) in 2005 to 2.6 bcfd in 2025. Peak daily demand in this region, which was 3.3 bcfd in 2005, is expected to grow to 4.6 bcfd by 2025. These figures confirm the substantial, existing regional demand and the significant increased needs in the near future. Conservation measures alone, which are estimated to only provide about 130 million cubic feet per day (mmcf) natural gas savings by 2022, will clearly be insufficient to address these forecasted energy needs. A forward-looking, permanent, proven solution to address this growing need must be implemented now.

### ***Land and Marine Use Patterns Around the Long Island Sound***

Broadwater's capability to provide reliable supplies of natural gas at a competitive price is paramount to sustaining and promoting development and uses of land and marine resources that are consistent with the historic and current patterns that establish community character. A review of relevant data and use patterns confirms the legacy of mixed commercial, residential, recreational and industrial uses within Long Island's coastal communities and the Sound. Significantly, the vessel traffic within the Sound has long included waterborne transportation for the delivery of a substantial portion of the region's energy supply, including petroleum and coal. One of the major findings of the Coast Guard's Waterways Suitability Report (WSR) prepared for the Project was that LIS is a mixed-use waterway shared by commercial, fishing, military and recreational interests. WSR §§ 2.2.1 and 8.2. Notably, the WSR identifies 34 existing marine oil facilities within LIS subject to regulation by the Coast Guard. WSR § 2.2.4.

A discussion of land and water use patterns and trends for Long Island and the Sound generally, and, more particularly, in those communities in which Broadwater's onshore facilities will be located, is set forth below.

### ***Land Use and Development Patterns in Long Island's Coastal Communities***

Land uses in the Sound coastal area are largely dependent upon where on Long Island they are located. Generally, population and overall development is less dense on eastern Long Island in the coastal areas directly south and east of the proposed Broadwater Project (e.g., eastern Suffolk County). Eastern Long Island comprises a mix of agriculture, open space, and rural/low density residential development. While some densely developed commercial/industrial uses occur along eastern Long Island (outside of organized maritime centers), the more intense urban development occurs primarily in the defined maritime centers such as Port Jefferson and the Village of Greenport (see Figures 35 through 38), where the Broadwater Project's on-shore facilities will be located. Applicable zoning and land use patterns for these communities confirm the consistency and compatibility of Broadwater's onshore support facilities.

***Land Use and Development Patterns -- Village of Greenport***

The proposed site for onshore support facilities in the Village of Greenport is located within the Long Island Sound Coastal Zone Management Area, as well as within the boundaries of the Village of Greenport's federally and DOS-approved Local Waterfront Redevelopment Plan ("Greenport LWRP"). These aspects of the Broadwater Project are thus evaluated under the Greenport LWRP for coastal zone consistency. Broadwater's Greenport LWRP analysis, which confirms the consistency of the Broadwater Project, is contained later on in this Chapter.

The goals of the Greenport LWRP are to protect and maintain water-dependent uses, revitalize underutilized waterfront areas, strengthen Greenport as a commercial fishing seaport, provide for public access to the waterfront, and enhance the Village as a commercial and business center (U.S. Office of Ocean and Coastal Resource Management [OCRM] 1996). Because the Broadwater Project's proposed waterfront facilities will be used for the transfer of people, equipment, and the transit of support vessels between land and the Broadwater LNG terminal, Broadwater's use is water-dependent and consistent with the objectives of the Greenport LWRP. Due to the flexibility in siting the other onshore facilities (i.e., office space and warehousing capabilities), and the ability to use existing infrastructure, Broadwater has not yet identified specific locales for these additional ancillary facilities.

Furthermore, the scope of construction, operation and maintenance of Broadwater's onshore, water-dependent support facilities are consistent with Greenport's LWRP, existing zoning and development patterns for other reasons as well. Greenport has a long history as a commercial fishing port reaching back to the early 1800s. Although the current local economy relies less on the waterfront's traditional use as a commercial fishing/maritime center and more on waterfront-related tourism and recreational uses, land use patterns in Greenport are still oriented toward traditional water-dependent uses, and the Village has identified plans and programs geared toward the efficient use of the waterfront for water-dependent uses (OCRM 1996).

The proposed permanent Broadwater-related facilities are consistent with the Greenport LWRP. The specific parcels proposed for these facilities are designated as Waterfront Area 1 and Waterfront Area 2, which include the following mix of land uses: marine commercial (9.2 acres [56.9%]), vacant disturbed abandoned (2.8 acres [17.2 %]), institutional (0.39 acres [2.4%]) and commercial (3.8 acres [23.5%]) (*see* Figure 35). The surrounding uses include commercial and marine commercial to the north, village residential to the west and south, and open water (Greenport Harbor) to the east (OCRM 1996). According to the Greenport LWRP, marine commercial uses in Waterfront Areas 1 and 2 currently include a variety of water-dependent businesses and activities, including but not limited to: retail and wholesale seafood product manufacturers, facilities for offloading fish from commercial vessels, dockage for transient vessels, and marine supply facilities (OCRM 1996).

The proposed permanent Broadwater-related facilities are also consistent with local zoning and future land use planning. The Greenport site is currently primarily zoned W-C: Waterfront Commercial. A small portion is zoned C-R: Retail Commercial (*see* Figure 36). Other zoning designations adjacent to the proposed site include R-A and R-B2 (Residential) to the east and west, and C-1 (Central Commercial) to the south. The W-C zoning designation



allows for uses supporting water-dependent uses such as marinas and docks. Under the Village of Greenport's future land use map, the proposed onshore facilities are located in an area designated as marine commercial.

Thus, based on existing usage, the uses proposed for the onshore Broadwater facilities -- the transfer of people, goods, and support vessels to and from the LNG terminal -- are expected to be consistent and compatible with the LWRP, existing zoning, and future land use patterns in the area. (OCRM 1996).

#### ***Land Use and Development Patterns --Village of Port Jefferson***

The proposed location for Broadwater's onshore, support facilities in the Village of Port Jefferson is also within the Long Island Sound coastal area. Port Jefferson does not have an approved LWRP (*see* New York State Coastal Management Program LWRP Status Sheet February 1, 2006). Port Jefferson does have an HMP, which Port Jefferson and local municipalities bordering the Port Jefferson harbor complex adopted in 1999. The Port Jefferson HMP provides an environmental, ecological, and natural resources evaluation of the Port Jefferson harbor and identifies existing sources of impacts on sensitive harbor resources. In the absence of an approved LWRP, the HMP is also used by the bordering municipalities as a planning tool to inform future development within the HMP area and the surrounding coastal area.

The majority of the location in the Village of Port Jefferson that has been proposed for Broadwater onshore uses consists of marine commercial/industrial shoreline type parcels. Sensitive ecological resources in the region, which include large bluffs occurring in various locations adjacent to the Port Jefferson Harbor shoreline and adjacent to portions of the potential onshore Project facilities area, are not anticipated to be impacted by construction and operation of the Broadwater Project because Broadwater's onshore facilities will be located in buildings that are existing and already constructed. Broadwater does not propose construction for its onshore facilities that would affect sensitive ecological resources that are along the Port Jefferson Harbor shoreline. In addition, as the natural areas are located away from the commercialized waterfront area and the proposed facilities will be consistent with ongoing activities (commercial marina, boat storage and aggregate transshipments) within the Port Jefferson Harbor area.

The historic use of Port Jefferson's waterfront has been primarily industrial. According to the Port Jefferson HMP, there has been a slow transition of Port Jefferson Harbor from primarily industrial waterfront use to one characterized by a mix of uses, including recreational, commercial, industrial, and residential. Current land uses adjacent to the proposed Project site include a mix of industrial uses to the north and west (including the KeySpan Power Plant), medium - to high-density residential use to the north and southwest, and open water (Port Jefferson Harbor) to the east.

Broadwater's proposed onshore facilities are consistent with existing land use patterns (*see* Figure 37), commercial and industrial uses and zoning within the Village of Port Jefferson, and are allowable and encouraged under the Village's and Town's planning documents (Village of Port Jefferson 1999). The Port Jefferson site is currently zoned primarily as M-W: Marina Waterfront (*see* Figure 38). The M-W zoning designation allows for uses

supporting water-dependent uses such as marinas and docks. Other surrounding zoning includes C-G: General Commercial to the south and R-2: One- and Two-Family Residential to the west and east (Suffolk County Planning Department 1997). Therefore, the facilities proposed to support the Project will be consistent with existing zoning.

The Port Jefferson HMP also states that because the amount of commercial waterfront is limited and concentrated in specific areas, priority for development should be given to water-dependent and water enhanced uses in these areas in order to provide the greatest economic benefits. [HMP at 30] In the Harbor Issues and Recommendations section of the HMP, Harbor Objective No. 1 states that the existing uses in lower Port Jefferson Harbor (in the area of the proposed Broadwater onshore facility), such as "boat yard dockage; ... transshipment and oil transfer facilities, and ... marinas," are of "vital importance to the economic vitality and historic character of the Village of Port Jefferson and should be enhanced" in a manner consistent with the protection of natural resources in the area spanning Port Jefferson Harbor (HMP at 100). Broadwater's proposed onshore facilities will be consistent and compatible with this express recommendation of the Port Jefferson HMP.

In addition to zoning codes pertaining to land use in the Sound, marine use, including vessel traffic, is a fundamental component that contributes to the Sound's character as a vibrant mixed-use region supporting a wide range of commercial, industrial, residential and recreational activities. A discussion of the importance of the Sound's waters for commerce and recreation alike, is set forth below.

### *Marine Vessel Traffic*

With its many major ports in both New York and Connecticut, Long Island Sound has long been an area of major marine vessel traffic and is a multi-purpose waterway. The WSR categorizes the entire transit route of the LNG carriers as a multiple use waterway which includes commercial, military, fishing and recreational interests. See WSR §§ 2, 2.2, 2.2.1, 2.2.3, 3.2 and 8.2. As shown in Table 34 below, thousands of vessels supporting regional commerce/industry traverse the Sound on an annual basis on both sides of the Sound. Approximately 46 million tons of petroleum and coal are moved by marine means in Long Island Sound annually. This statistic is significant because it illustrates that Broadwater's proposal to import approximately 7 million tonnes per year of LNG by waterborne LNG carriers is wholly compatible with existing marine vessel uses of Long Island Sound. Tankers currently traversing the Sound also carry oil and chemicals; Table 25 presents 2003 commercial vessel traffic counts for deepwater ports in Long Island Sound. The WSR states that deep draft vessels transiting the Sound range in size from 500 to 902 feet and that those in excess of 800 feet in length generally carry liquid petroleum or coal. WSR § 2.2.1.1. Commercial shipping in the Broadwater Project area mainly involves vessels arriving and departing the ports of Northport, Northville, and Asharoken, New York, and Bridgeport and New Haven, Connecticut. Based on U.S. Army Corps of Engineer ("USACE") data, the Connecticut ports receive significantly more traffic than the New York ports. In New York, Asharoken registers approximately 150 vessels per year, Northville registers over 500 vessels per year, and Northport has 24 vessels calling approximately on a monthly basis. In addition to these ports, which can accommodate deeper draft vessels, Port Jefferson's port also has significant commercial/industrial traffic. Its port, however, cannot support deeper-draft vessels, and as such is serviced by smaller vessels.

In addition, and directly relevant to compatibility and suitability analyses, two offshore oil platforms are located in the Sound -- the Tosco Corporation's Riverhead Terminal Offshore Wharf offshore of Northville, New York, and KeySpan Energy's Northport Power Plant Offshore Fuel Wharf northeast of Northport, New York. These fixed oil platform facilities routinely receive oil tanker traffic for specified periods of time and are substantially closer (within 1.5 miles of the coastline) to the Long Island coastline than Broadwater's proposed floating storage and regasification unit ("FSRU"). ConocoPhillips also operates an offshore petroleum unloading terminal approximately two miles off the coast of the Town of Riverhead. The Broadwater Project is consistent with these already-existing commercial/industrial uses.

In the absence of a marine traffic-routing scheme in Long Island Sound, federal navigational aids and standard marine practices have led to the development of established traffic patterns and generalized shipping routes in the Sound. The main shipping route runs generally down the center of the Sound on a straight course from deepwater areas in the eastern Sound to the deepwater pass through Stratford Shoal, with a secondary shipping route trending from northeast to southwest toward Northport, New York. Vessel traffic branches off the main shipping route to enter deepwater ports (*see* Figure 29).

**Table 34 Commercial Vessel Traffic in Long Island Sound (2003)**

Deepwater Ports	Vessel Trips Per Year	Transit Tankers
Bridgeport, CT	21,588	27
New London, CT	10,564	10
New Haven, CT	3,603	469
Northville, NY	1,207	31
Asharoken, NY	282	11
New York, NY**	50	50
Northport, NY	24	Unknown

\* Foreign and domestic traffic were totaled for deepwater ports; fishing vessels and escort tugs were not included.

\*\* While 21,789 vessels were reported for New York Harbor, the majority of these vessels do not approach through Long Island Sound due to extreme currents.

The available trend data from local and regional planning and development documents as well as a review of commercial shipping and port data confirm that recreational uses and high end residential development do not present the sole development patterns and trends within the Long Island Sound coastal region. In fact, the data in the Long Island Sound Waterborne Transportation Plan shows that historic water-based commercial/industrial activities (i.e., use of the Sound for waterborne freight transportation) continue to be balanced with the Sound's development as recreational resource.

In addition, in both the maritime centers of New York (inclusive of Port Jefferson) and Connecticut (e.g., Bridgeport, New Haven, and New London), historic commercial/industrial uses are not only continuing, but are expanding. For example, of the top five regional commodities that are transported within Long Island Sound (generally categorized as petroleum/coal, clay/concrete, distribution/warehouse, food, and chemicals<sup>3</sup>), transportation of

<sup>3</sup> Long Island Sound Waterborne Transportation Plan.

petroleum and oil make up 95% of all Long Island Sound vessel traffic. Vessel traffic is anticipated to grow approximately 1.7% per year from 2000 through 2025. These data regarding the historic and continued reliance on the Sound confirm its pivotal role as a center of water-based and water-dependent commerce and industry and support the decision to site the compatible and suitable Broadwater Project in the Long Island Sound.

#### ***Consistency with Policies of Other Long Island Sound Plans***

Broadwater has identified other plans and programs developed to further the protection and preservation of the Long Island Sound, adjacent coastlines, and coastal communities. These include:

- Long Island Sound Comprehensive Conservation and Management Plan
- Long Island North Shore Heritage Area Management Plan; and
- Finalized and Approved LWRPs and HMPs.

Broadwater's analysis of potentially applicable and enforceable LWRPs and HMPs are presented in Section 4.2. A brief discussion confirming the Broadwater Project's compliance with other plans, to the extent they address land and marine uses and development patterns, is set forth below.

#### ***Long Island Sound Study Comprehensive Conservation and Management Plan ("LISS Plan")***

The EPA and the states of New York and Connecticut formed the Long Island Sound Study ("LISS") in 1985 in response to concerns regarding the health of the Sound's ecosystem. In 1994, the LISS completed a Comprehensive Conservation and Management Plan ("LISS Plan") that identified certain issues requiring special attention, including land use and development. The Broadwater Project is consistent with the LISS Plan because Broadwater's proposed onshore facilities and the FSRU are water-dependent uses that, among other things, will not adversely affect water quality throughout the watershed. (LISS Plan at 8-9; 125-134). Additional discussion regarding Broadwater's conformance with the goals and targets of the LISS Plan is set forth in Broadwater's response to LIS CMP Policy 5.

#### ***Long Island North Shore Heritage Area Management Plan***

The Long Island North Shore Heritage Area Management Plan was developed to provide the communities in the north shore region of Long Island with the tools needed to preserve and celebrate the cultural, historic, and natural heritage of the north shore. (The Long Island North Shore Heritage Area is generally described as the north shore from the Long Island Expressway or State Route 25 (whichever is farther south) to the Connecticut line in Nassau and Suffolk counties.) The plan, which addresses the New York State Heritage Areas System goals of cultural resource management for regional economic revitalization, highlights: (1) identification and preservation of natural and historic places; (2) education about local, regional, and natural history; (3) recreational use of special places; and (4) economic development with public and private investment. The Broadwater Project is consistent with these four goals for the following reasons:

First, the Long Island North Shore Heritage Area Management Plan has the three-part mission of preservation, revitalization and economic expansion, and sustainable heritage development. The goals and objectives of the plan seek to identify potential areas of conflict and mitigate them while providing a framework for enhancing the similarities and the differences of the people of the north shore and their communities. The policies and actions are the primary implementation tools of the plan and include preservation, sustainable heritage development, and economic revitalization for the Heritage Area. The proposed floating storage and regasification unit (FSRU) and subsea pipeline will not adversely impact the stated goals of the North Shore Heritage Area Management Plan because the Project has been designed to preserve the North Shore heritage and historical resources, protect environmental, natural and maritime resources, and enhance the economic vitality and cultural life within the Heritage Area, which are the primary intentions of the plan.

In addition, the Management Plan calls for strategic planning to protect water (coastlines, beach views, and water access), sites and structures (landmarks, estates, and historic sites), sites of historic maritime activity, and natural areas. The Broadwater Project was sited to avoid impacts on wrecks and other cultural resources to the maximum extent practicable. The Visual Resource Assessment (VRA) for the Broadwater Project evaluates the Project's impact on historic sites or structures, sites of historic maritime activity, and onshore natural areas. The Broadwater Project was also evaluated to determine any potential impacts on coastline resources, including those associated with beach views. While the FSRU will be visible from the shore (including beach areas) on clear days, the facility will be vessel-like in appearance and thus, similar to views of ships that already use the Sound. The distance from shore coupled with the facility design, which minimizes contrast, combine to lessen the overall visual distinction and perceived importance of the Broadwater Project within the context of the regional landscape (waterscape). Because of the FSRU's limited visibility and design and operating characteristics that render it consistent with other commercial/industrial vessels historically and currently present in the Sound, the Broadwater Project is not anticipated to diminish users' enjoyment or "sense" of the Sound.

Moreover, the Broadwater Project is not expected to adversely affect preservation of the cultural, historic, and natural resources of the Sound. Although there will be short-term impacts on marine natural resources during construction of the interconnection pipeline, the Broadwater Project is anticipated to have long-term environmental benefits. By providing a reliable source of clean-burning natural gas to the target markets, the Project will reduce dependence on other fuels (e.g., coal and petroleum). Any corresponding reduction in overall regional emissions would contribute to regional air quality improvements. Thus, the Broadwater Project is consistent with the North Shore Heritage Area Management Plan.

Finally, economic revitalization is a key component of the North Shore Heritage Area Management Plan and calls for: (1) creative land use to protect structures and districts, guidance for new construction; (2) protection and enhancement of existing features; and (3) focused heritage development with increased economic viability. The main focus of these activities are on the already-developed or constructed environment, including downtown areas, maritime communities, and commercial centers; natural environmental features, including access points and open space; and development of focal point or attractions for interpretation and celebration of the Heritage Area. The Broadwater Project was sited in the middle of the widest

part of the Sound to avoid conflicts with these onshore, coastal environments, especially those areas designated as important historic and cultural resource areas. Broadwater's onshore facilities are consistent with and do not conflict with local land use and comprehensive planning initiatives or the objectives for the Heritage Area. Broadwater's onshore facilities may be located within established maritime centers (e.g., Port Jefferson) and will make use of existing structures and facilities. And business support activities at Broadwater's onshore facilities (e.g., personnel transfer, boat dockage and storage of supplies) will be within zoning districts that allow for these types of activities.

***The Broadwater Project is Consistent with the Mixed-Use Nature of the Long Island Sound Coastal Area***

Long Island's character is defined by the "collection of natural, recreational, commercial, ecological, cultural, and aesthetic resources" that make up Long Island's coastal communities and its landscape. (LIS CMP Policy 1, Explanation). In other words, "the mix of historic structures, traditional harbors, residential areas, open spaces, working waterfronts, agricultural land, and tree-shaded country roads that make up the landscape of the Sound communities" all contribute to "a sense of the Sound." (LIS CMP, Ch. 1 at 3 "Charting the Course"). The historic coexistence of these mixed, diverse uses confirms that no single type of use has been or should be elevated to the exclusion of others, and the LIS CMP confirms that this "contrast and interplay of the green and the built environment should be maintained and celebrated as essential components of community character." *Id.* The Broadwater Project is wholly consistent with these objectives and those set forth in LIS CMP Policy 1, for the reasons discussed below.

***The Broadwater Project will be Consistent with Development in Traditional Waterfront Communities***

Traditional waterfront communities are those communities that have historically "contained concentrations of water-dependent businesses; possess a distinctive character; and serve as focal points for commercial, recreational, and cultural activities of the region." (LIS CMP, Definitions). The Broadwater Project's on and offshore facilities, including the technology and design of the LNG terminal and the interconnection pipeline, are consistent with the stated goals for such communities.

The Broadwater Project's onshore, water-dependent business support facilities, which will be required for the mooring of support vessels (i.e., Project tugs) and the transfer of personnel and waterborne materials to and from the FSRU, will be appropriately located in either the Village of Port Jefferson or Greenport.<sup>4</sup> Whether in Port Jefferson or Greenport, Broadwater's onshore, water-dependent support facilities are consistent with the historic and

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<sup>4</sup> Greenport's Mayor is openly in favor of the Broadwater Project and has stated his desire that Broadwater select Greenport to house the onshore, water-dependent business support facilities. Mayor Kappell stated, "If [the Broadwater Project] goes through, it's a bonanza for Greenport....This is a direct hit for our established policy for encouraging a working waterfront." Approximately 3,000 people worked on Greenport's waterfront building Navy ships during World War II, according to Greenport's mayor, David Kappell. ("A Welcome Shore for a Natural Gas Plant?", John Rather, The New York Times, 2/12/06). About the Broadwater Project, Mr. Kappell stated, "This would be back to the future for Greenport." *Id.*



current uses and zoning of these communities, and they will sustain the pattern of development of revitalizing traditional waterfront communities and preserve onshore open space and views, thereby enhancing the character of these coastal communities.

Significantly, no portion of the FSRU or the interconnection pipeline to the IGTS is proposed to be constructed or operated in or adjacent to traditional waterfront communities. During construction of the pipeline and mooring system, Broadwater will require water-dependent property for staging that will enable the transportation of materials and workers out to the LNG terminal and pipeline site. Such staging, however, will take place in existing buildings in appropriately zoned locations. Broadwater would thus be relying on existing, onshore infrastructure that would avoid competition for other open waterfront property. As a result, the Broadwater Project will not place additional pressures on open, waterfront property, which is of high value and limited availability for water-dependent commercial and recreational users. Similarly, operations and maintenance for components of the LNG terminal will primarily take place offshore, supported by water-dependent operations that will be located in existing buildings in traditional waterfront communities.

### ***Broadwater Makes Appropriate Use of its Coastal Location***

In determining the placement of its onshore and offshore facilities, the Broadwater Project takes appropriate advantage of its coastal location. In conformance with established coastal policies, Broadwater proposes to site onshore facilities on the waterfront, using existing infrastructure rather than building facilities at a new location. Additional, ancillary facilities (i.e., office space and warehousing) will be located elsewhere, again, in existing space.

The Broadwater Project also appropriately uses the waters of the Sound for placement of the FSRU (much in the way that the oil platforms in Northville and Northport appropriately use their respective locations in the Sound). Broadwater's FSRU location, 9 miles offshore, (1) eliminates altogether the potential for competing water-dependent uses along the Sound's coastline, (2) avoids safety-related issues that would arise in the context of attempting to site the Project in an onshore location (as acknowledged by the Coast Guard in the WSR that the site selected for the Project has a number of significant safety and security benefits when compared to those in other locations or using other technologies, especially with respect to threat and consequence since it is remote from population centers (*see* WSR §§ 5.2.2 and 8.2)), (3) facilitates Broadwater's reliance on waterborne transportation to deliver overseas-sourced LNG, (4) minimizes visibility from the Long Island shoreline (*see also* LIS CMP Policy 3, *infra*), (5) is appropriate for the LNG terminal relative to the scale of other features in the Sound, including vessels engaged in commerce, (6) respects the relationship among developed property, open space, and the water, and (7) protects historic and cultural resources within Long Island Sound (*see also* LIS CMP Policy 2, *infra*). This location also minimizes potential conflicts with other water-dependent users of the Sound, including commercial fishermen and recreational users. As noted in the WSR, the proposed location of the FSRU is in the vicinity but outside of established commercial vessel thoroughfares. WSR § 2.2.2.3. The predominance of east-west transits are to the South of the proposed location and the concentration of north-south transits are to the east of the proposed location. *Id.* In addition, the WSR confirm that the highest density of recreational boating is generally within 2.3 to 3.5 miles of the shore on both coasts of Long Island Sound and that most marine events are held close to shore. WSR § 3.1.2.3. To the extent that such use

conflicts could not be avoided, Broadwater is taking the steps necessary to minimize them.<sup>5</sup> A more detailed analysis of potential marine conflicts is contained in Broadwater's response to LIS CMP Policy 9 and in Appendix E.

***Broadwater will be Protective of Stable Residential Areas***

The Broadwater Project is also important to the protection of Long Island's stable residential areas. As a result of its location in Suffolk County, the Broadwater Project will provide substantial increases to the tax base of Suffolk County, thereby diminishing the tax burden of Long Island residents. Broadwater's total investment is estimated at nearly \$1 billion, and annual operational spending for the LNG terminal is estimated to generate \$3.1 million in state and local tax receipts for Suffolk County. If approved, the Broadwater Project will generate 923 short-term regional construction and related jobs and 30-60 permanent jobs in the local economy for skilled workers. In 2010, \$5.9 million in tax receipts is estimated to accrue to state and local governments in Suffolk County from construction contracts, while \$6 million in state and local tax receipts will be generated from multiplier impacts. The anticipated tax revenues and the resulting primary and secondary economic benefits that will result from the construction and operation of the Broadwater Project will make available additional funds to enhance coastal communities' character and infrastructure.

The Broadwater Project will result in other benefits that will protect stable residential communities as well. For example, the introduction of a competitively-priced, reliable supply of natural gas will be a financial benefit to millions of homeowners. It will also allow for continued compatible residential and supporting development in or adjacent to such areas. Additionally, property values are expected to remain unchanged or increase in the presence of the Broadwater Project. Broadwater completed an analysis of the potential effects on real property values resulting from proximity to an LNG facility or other comparable energy infrastructure facility. The purpose of this analysis was to analyze whether location or proximity to an industrial facility has an impact on residential market prices by evaluating the relationship between residential property values and energy facilities with operating histories. Broadwater's analysis was conducted using generally accepted economic, statistical, and market appraisal principles based upon available data. Broadwater's Property Values Impact Study is attached as Appendix M.

The results of Broadwater's Property Values Impact Study establish that average residential real estate values in close proximity to an energy facility are not adversely affected by its presence. And in some cases, the data demonstrates that the property values in close proximity to the facility appreciate faster than those located farther away. While Broadwater was not able to evaluate facilities of a similar nature to the FSRU, data is available for onshore LNG terminals, other petroleum facilities, and a regional onshore nuclear power plant, which would have similar, if not greater, perceived concerns from the local populace. Broadwater evaluated the effects on property values relative to the following facilities: Millstone Nuclear

<sup>5</sup> The express language of LIS CMP Policy 1 states among its objectives that the pattern of development should be one that "minimizes adverse effects...." The use of such language confirms the drafters' tacit understanding that all development will result in some impacts. Therefore, although Broadwater is attempting to avoid development-related adverse effects, where such effects are unavoidable, Broadwater is permissibly minimizing any Project-related impacts.

Power Plant (Waterford, CT); Santa Barbara Offshore Oil and Gas Platforms; LNG facilities in Everett, Massachusetts and Cove Point, Maryland; and the Commander Oil terminal in Long Island Sound. (*see generally* Appendix M).

***Broadwater is Consistent with the LIS CMP Objectives for Natural Areas, Recreation and Open Space***

The Broadwater Project will also maintain and enhance natural areas, recreation, open space, and agricultural lands, because Broadwater's onshore, water-dependent business support facilities will be located in existing, appropriately zoned buildings. Broadwater will not be competing for open waterfront property, thereby freeing up high-value land for other water-dependent uses. Broadwater's onshore facilities located in existing buildings, will provide economic benefits while avoiding development pressures to Long Island's coastal communities.

As for offshore facilities, construction and operation of the FSRU will result in limited restriction on access to the Sound for other recreational and commercial users. The total area of the Sound is 1,300 square miles (3,370 square km), containing approximately 2.4 tcf (68 billion m<sup>3</sup>) of water. When considered in relation to the total area of the Sound's usable waters, the FSRU's impact will be comparatively small. There are a multitude of locations and areas within the Sound that will remain available for public access and recreation -- without any restrictions whatsoever -- when the Broadwater Project is in operation. And the limited restrictions that will result from the Broadwater Project are consistent with already-existing safety and security restrictions present in other portions of the Sound. As noted in the WSR, several safety and security zones already exist within LIS. WSR § 2.3.2. These include zones surrounding the Naval Submarine Base, New London, CT, General Dynamics Electric Boat Shipyard, Dominion Millstone Nuclear Power Plant and all anchored Coast Guard vessels. *Id.* Safety and security zones have also been proposed surrounding the Northport and Riverhead Offshore Platforms *Id.* In addition, the safety/security zone recommended by the Coast Guard for the Broadwater FSRU represents only a very small portion of the total area of Long Island Sound (0.12%). WSR § 8.2.

The stationary FSRU will occupy a portion of open waters but its visibility will be limited by its design and placement 9 miles offshore. (*see* LIS CMP Policy 3 response). All shoreline receptors will view the proposed Broadwater Project within the "far background distance" zone and, as a result, the FSRU elements will lose detail and become less distinct. Typically, atmospheric perspective (hazing) reduces colors to blue-greys, while surface characteristics (lines and textures) are lost. On clear days, the FSRU and LNG vessels may be a point of visual interest for observers at the closest vantage points along both the New York and Connecticut coastlines. The LNG terminal will decrease in visibility from distant receptors up and down the coast with increased distance over the horizon and the compounding effect of atmospheric perspective. It is anticipated that typical viewers, such as ferry riders, will likely perceive the FSRU as consistent with existing views, which currently encompass other vessels and structures, including Tosco Corporation's Riverhead Terminal Offshore Wharf offshore of Northville, New York, and KeySpan Energy's Northport Power Plant Offshore Fuel Wharf northeast of Northport, New York. Because of its distant offshore location, in a portion of the Sound already used for water-dependent commerce, and the plethora of commerce around it, the FSRU will not result in a loss of value and "sense" of the Sound.

The Broadwater Project will also contribute to the enhancement of community character for the Sound's coastal communities through the creation of a Social Investment Program, which will promote the maintenance and enhancement of natural areas and open space on Long Island, including those used for recreation (LIS CMP Policy 1.4). Broadwater's SIP is discussed in Appendix L.

***Broadwater is Consistent with the LIS CMP Objectives for Land Use, the Environment and the Economy***

Clean fuel, such as natural gas, is needed to enable and promote the infrastructure and development that sustains Long Island's coastal communities, including its schools, hospitals, and businesses. With the Broadwater Project, governmental services and private business alike will be able to rely on a competitively priced, stable supply of natural gas. This, in turn, will allow for a greater degree of certainty in planning and budgeting, which is important to the stability of every economy.

Another benefit of the Broadwater Project will be its ability to provide natural gas in sufficient quantities and with the necessary reliability to repower power generation facilities that currently burn coal and oil. Repowering these facilities with natural gas is likely to result in significant environmental benefits throughout the Long Island Sound coastal region, notably with regard to air emissions. According to Renewable Energy Long Island, Inc. (RELI), repowering has the potential to reduce air pollution emissions from nitrogen oxides, sulfur dioxide, and carbon dioxide by as much as 90%.<sup>6</sup>

There is unlikely to be a proliferation of other LNG or industrial facilities in the Sound if the Broadwater Project receives its necessary authorizations, permits, and approvals and becomes operational. Concerns regarding rampant "industrialization" of the Sound are simply unfounded. As stated above and in the WSR prepared for the Project, the Sound has a long history of commercial and industrial use that, though a smaller proportion of the regional economy, is still today undeniably part of the Sound's mixed-use character. WSR § 2.2.1 (for the years 2003 through 2005, ports within Long Island Sound experience an average of 2,300 commercial vessel arrivals per year. For those years, there was an average of approximately 462 foreign-flagged vessel arrivals annually at port facilities within Long Island Sound located in both Connecticut and on the north shore of Long Island). The Broadwater Project's relatively benign impacts are not inconsistent with this current and historical legacy. WSR § 8.2 (The Project would increase the overall usage of the Sound by commercial vessels by less than 1%).

From a practical perspective, it is also important to note that siting a project in an offshore location is a costly and highly specialized undertaking, one that, from both a construction and operations standpoint, makes sense for only a limited number of projects. This type of project siting and approach would not be widely applicable to the majority of industrial projects that could potentially be proposed in Long Island Sound. In addition, Broadwater's LNG terminal has been strategically sited to meet the demands of a specific regional target market -- Long Island, New York City, New York City metropolitan, and Southern Connecticut. It is doubtful that additional LNG projects would seek to be located within the Long Island

<sup>6</sup> See <http://www.renewableenergylongisland.org/>, "Enviros Demand Repowering of Dirty Power Plants as Part of KeySpan Deal," RELI Press Release, March 8, 2006.

coastal region, since the satisfaction of market demands by Broadwater would significantly reduce or eliminate the need for additional LNG supply within the region, potentially rendering such other projects, if any, uneconomic.

The Broadwater Project is consistent with LIS CMP Policy 1 because it encourages patterns of development in the Long Island Sound coastal area that benefit community character, preserve open space, make efficient use of existing infrastructure, make beneficial use of a coastal location, and minimize the adverse effects of development. In addition, construction and operation of the Broadwater Project will foster a pattern of development that is consistent with the objectives of this policy because it will bring clean, reliable energy to the region. The introduction of a new, stable, and competitively priced supply of natural gas is fundamental to maintaining existing infrastructure and business and attracting new business consistent with the patterns of development and community character that have historically defined Long Island Sound. Simply put, the pattern of development in the Long Island Sound coastal area reflects the balanced use of the Sound's natural resources to support commerce. See State CMP Final Environmental Impact Statement (FEIS), II-2-4 & II-2-5. Broadwater is consistent with and will foster the continuation of that pattern of development, which recognizes the need for and the desirability of multiple uses within the Sound to fully realize the benefits of one of the State's most abundant natural resources, i.e., the "vast expanses of water surrounding Long Island." *Id.* at II-2-5.

**POLICY 2:** *Preserve historic resources of the Long Island Sound coastal area.*

- 2.1 *Maximize preservation and retention of historic resources.*
- 2.2 *Protect and preserve archaeological resources.*
- 2.3 *Protect and enhance resources that are significant to the coastal culture of the Long Island Sound.*

The Broadwater Project is consistent with and furthers the objectives of this policy, largely through the protection and preservation of existing historic, archaeological, and cultural resources within the Long Island Sound coastal area, and on Long Island.

#### *Offshore Location*

By siting the FSRU 9 miles offshore and using existing onshore sites already used and zoned for commercial purposes, the Broadwater Project is designed to preserve the historic resources of the Long Island Sound coastal area. Recognizing the importance of the coastal culture of the Long Island Sound region, which includes archaeological sites and historic structures that reflect the Sound's diverse heritage, Broadwater completed an extensive survey of Long Island's historic, archaeological, and cultural resources to determine potential impacts, if any, that may result from the Project. In addition to confirming the location of previously identified resources, these cultural surveys identified previously unknown resources within the Sound, thereby confirming the thoroughness of the surveys, and furthering the understanding of the historic context of the Sound.

Broadwater's archaeological surveys of the Project area establish that cultural resources will not be affected as a result of the construction and operation of the Project.

Although 9 subsea features in the proximity of proposed pipeline were identified as having the potential to be National Register of Historic Places (NRHP) eligible, these sites can be avoided, protected, and preserved through the use of mid-line anchor buoys. No significant features were identified within the area immediately proximate to the FSRU. As such, construction and operation of the FSRU will not restrict potential future access to any potentially significant cultural sites.

Based on available information from the National Oceanic Atmospheric Administration (NOAA) Automated Wreck and Obstruction Information System (AWOIS), several wrecks appear to be located in the general Project area, the majority of which are in the vicinity of Stratford Shoal. Broadwater also completed a survey that included bathymetry, side-scan sonar, and magnetometer studies in March and April 2005 to develop a route for the proposed subsea pipeline. An archaeological review of the survey results revealed multiple potential wrecks and unknown marine obstructions in the study area. Consequently, the subsea pipeline route was revised to avoid these potential wrecks and any other unknown marine obstructions. The proposed pipeline route is a minimum of 500 feet (152 m) from all potential wrecks and unknown marine obstructions; therefore the proposed subsea pipeline will be consistent with the policy.

Broadwater completed a safety and reliability assessment to address scenarios that could have potential for impacts on historical and archaeological resources (*see* Resource Report No. 11, Safety and Reliability). For example, potential hazards of LNG that could impact historic and archaeological resources include pool fires, flammable vapor clouds, and rapid-phase transition. Broadwater is designed to prevent such events and it is prepared to successfully address incidents, if any, to provide maximum protection to the Sound's residents and users, the natural resources of the Sound, and its historic, archaeological and cultural resources should such an event occur. Protection of historic and archaeological resources would be achieved through the implementation of a plan that includes a multiple level safety plan that will prevent problems from escalating beyond the immediate area, including radar and positioning systems to alert crew to traffic and other hazards around the vessel; primary and secondary barriers on storage tanks to prevent leakage or rupture; leak detection and mitigation through continual monitoring and emergency shutdown procedures; fire prevention procedures; and establishment of a safety zone that extends beyond the FSRU and LNG carriers. In addition, the Coast Guard completed a comprehensive safety and security assessment of the Project as part of the WSR. Based upon this assessment, the Coast Guard has determined that the waters of Block Island Sound and Long Island Sound are suitable for LNG vessel traffic and the operation of the Project provided that measures are implemented to responsibly manage the safety and security risks associated with the Project. WSR § 8.3. These strategies include several mitigation measures, including the Coast Guard's establishment of safety/security zones around the Broadwater FSRU and the LNG carriers transiting the Sound. WSR § 8.4.

In addition, an emergency response plan will be in place to address potential hazards and disasters. This plan will be consistent with those recommendations made in the WSR. These measures taken together will limit any potential impact on archaeological resources in the vicinity of the proposed FSRU and subsea pipeline. It should be noted that LNG carriers possess an outstanding safety record and have been operating without significant incident internationally for over 40 years.



Last, since the time that Broadwater initiated its survey regarding the potential existence of historic and/or cultural resources within the vicinity of the Project site, Broadwater has maintained close coordination with State Historic Preservation Office (SHPO). Results of the cultural/geophysical surveys were submitted to SHPO for review and Broadwater has largely resolved outstanding concerns and issues raised by SHPO (*see* Resource Report No. 4, Cultural Resources). SHPO has confirmed that it is satisfied with Broadwater's survey and analysis and has not requested any additional surveys.

#### *Onshore Location*

With the identification of the two potential onshore locations at Port Jefferson and Greenport, Broadwater reinitiated contact with SHPO to assess the cultural sensitivity of these two sites. Based on the significant urban development at both sites, SHPO has concurred that intact prehistoric archaeological resources are not likely to occur at either site. With respect to the historic resources, NHRP-listed sites exist in proximity to both sites. If the Greenport site is selected, SHPO has recommended that Broadwater submit design documents to the SHPO for review due to the presence of two National Register listed historic districts adjacent to the site (Greenport Village Historic District and Greenport Railroad Complex). SHPO also indicated that the proposed site may contain potentially National Register eligible buildings. Broadwater is committed to working with SHPO as this Project moves forward to ensure that any proposed facilities are consistent with the existing historic resources in Greenport and that any identified historic and archaeological resources at proposed waterfront facilities at Greenport are fully protected and preserve the Sound's diverse cultural heritage.

For all these reasons, the proposed subsea pipeline route, the FSRU, the LNG carriers transiting the Sound and the two potential onshore locations will be consistent with this policy.

**POLICY 3:** *Enhance visual quality and protect scenic resources throughout Long Island Sound.*

- 3.1 *Protect and improve visual quality throughout the coastal area.*
- 3.2 *Protect aesthetic values associated with recognized areas of high scenic quality.*

The Broadwater Project is consistent with and furthers the objectives of this policy, as the distant, 9-mile offshore location prevents impairment of and protects components that contribute to Long Island Sound's high scenic quality. The Broadwater Project recognizes the significant contribution of visual quality to the character of the Sound, including the importance that "cultural elements in the landscape and the interplay of the built and natural environments" play in creating that visual quality. (LIS CMP Policy 3) The Broadwater Project has been designed and located to minimize the introduction of discordant features into the coastal area. Broadwater's VRA (which was prepared in support of its recently-submitted FERC application), provides a qualitative and quantitative assessment, including comprehensive inventory of the scenic resources and potentially sensitive receptors within the vicinity of the Broadwater FSRU. A copy of the VRA is annexed hereto as Appendix K.

The FSRU has been located near the center of the Sound at its widest point in part to maximize the distance from any coastal vantage point and minimize potential visual impact on coastal resources. At its proposed location 9 miles off the coast, there is no location in the Sound where the Project would be substantially farther from the nearest coastal observer. And because of its distant offshore location, in most cases the LNG terminal is not visible from urban areas or historic maritime communities and will not adversely affect dynamic scenic elements of the coastal area. The inventory of potentially sensitive receptors that was prepared as part of Broadwater's VRA confirms the limited number of potentially sensitive locations from which the FSRU will be visible. Appendix K at 40.

There are many locations from which the Broadwater Project will not be visible at all or will be only minimally visible, due to its siting location, design, and coloring, and further depending upon weather conditions, daylight available, and haze. A detailed discussion of factors contributing to potential visibility of the Broadwater Project is set forth in section 3.0 of the VRA. See Appendix K. From the locations from which it is visible, the Broadwater Project will appear similar in visual character to an ocean going vessel on the distant horizon. Numerous large vessels operate routinely on Long Island Sound, including deep draft vessels exceeding 800 feet in length which generally carry liquid petroleum products or coal. Generally foreign flagged commercial vessels calling at LIS ports range in length from 500 to 902 feet. WSR § 2.2.1.1. Broadwater's LNG terminal is designed as a single unified and consolidated grouping of elements. By necessity, no space is wasted, and as a result, the Broadwater Project preserves space on the open waters of the Sound and provides visual organization of its water-based facilities. Many land based-observers may find the FSRU and LNG carriers traveling to/from the FSRU to be points of visual interest or at least a common, recognizable, and accepted feature of the Sound. Therefore, the Broadwater Project is consistent with the stated objectives of this policy, which calls for the recognition of water-dependent uses as important additions to the visual interest of the Sound's coast.

The Broadwater Project is also consistent with this policy because it protects scenic values that are associated with public lands, including public trust lands and waters, and natural resources. There are no scenic areas of statewide significance within the Broadwater Project viewshed. The Broadwater Project will also not be at all visible from the Nissequogue River, one of the natural resources of greatest concern for preservation under the LIS CMP. *Id.* In addition, because the FSRU resembles a ship similar to those already transiting the Sound, it is unlikely to affect viewers' perception or "sense" of and values associated with the Sound. The distance from shore coupled with the facility design (which minimizes contrast) combine to lessen the overall visual distinction of the Project within the context of the regional landscape (waterscape). When visible, the proposed facility will generally appear as a small two-dimensional rectilinear form on the horizon from distant coastal vantage points. And while the outline of the FSRU will break the visible horizon from distant coastal vantage points, it will appear quite low and as distance increases will be difficult to distinguish on the horizon. As a result, it will not be a dominant feature in the viewscape.

Because of the FSRU's limited visibility and design and operating characteristics that render it generally consistent with other commercial/industrial vessels historically and currently present in the Sound, the Broadwater Project is not anticipated to diminish users' enjoyment or "sense" of and values associated with the Sound. A person's "sense" of and values

associated with the Sound are presumptively predicated on the range of values that people ascribe to Long Island Sound's natural resources, including the scenic values of public lands. Such values are inherently reflective of and predicated upon their perception of the multitude of mixed uses that have historically existed and remain within the Sound today. On a continuum, there are users of the Sound who believe that the quality of the Sound's resources can only be enjoyed if maintained in their most natural state and those who appreciate the need for and desirability of a balance between commercial/industrial growth and the preservation of the Sound's coastal resources. Those on the latter end of the continuum recognize that the mixed uses within the Sound (i.e., recreation, commercial fishing, and industry/commerce, among others) are important factors that, when combined, make up the "sense of the Sound." The Broadwater Project will be protective of the "sense" of and values associated with the Sound as a result of its design and location, as well as the environmental benefits (e.g., improvement in air quality and related visibility) that will likely result with the use of natural gas and the repowering of existing power generation facilities.

Significantly, the proposed offshore location avoids the need to construct a new or expanded industrial port, gas storage tanks, re-gasification facilities and shoreline crossings to connect to the IGTS pipelines on Long Island's coast. Such land-based facilities to support an LNG terminal could be considered discordant and disruptive to the scenic quality of Long Island's coastline. In this manner, the proposed Project completely avoids introducing discordant features within the coastal area and preserves the scenic quality of the coastline. Additionally, the offshore Project location does not require removal of any existing shoreline vegetation, which would likely be required with the development of an on-shore terminal.

Broadwater's onshore facilities will be located at existing, commercial buildings. This use of existing buildings is consistent with and furthers the objectives of this policy by avoiding the introduction of discordant structural features on the landscape. These onshore facilities will provide support operations for the LNG terminal and FSRU, the primary purpose being the transfer of people, supplies, and FSRU support vessels to and from the Project area 9 miles off the coast. These water-dependent uses to support Broadwater's business are consistent with this policy, which, as noted above, recognizes the desirability of "water-dependent uses as important additions to the visual interest of the Sound's coast."

In addition to Broadwater's efforts to maintain the visual quality of the Sound and its coastline through location, configuration, and design, the Broadwater Project also presents the opportunity for aesthetic offset mitigation. Such aesthetic offsets might include, among other things, removal of non-project related eyesores within the coastal area, or participation in the Long Island Sound floatables clean-up program.<sup>7</sup> The floatables program is an organized initiative to remove debris that commonly washes ashore on Sound beaches. Broadwater's investment in such a program could provide a significant improvement in the visual quality of the public coastline.

Both the on and off shore facilities of the Broadwater Project are protective of the visual quality of the Sound and its recognized scenic resources. For these reasons, and those

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<sup>7</sup> See <http://www.longislandsoundstudy.net/pubs/facts/fact8.pdf>.

more fully addressed in Broadwater's VRA, the Broadwater Project is consistent with this policy.

**POLICY 4:** Minimize loss of life, structures, and natural resources from flooding and erosion.

- 4.1 *Minimize losses of human life and structures from flooding and erosion hazards.*
- 4.2 *Preserve and restore natural protective features.*
- 4.3 *Protect public lands and public trust lands and use of these lands when undertaking all erosion or flood control projects.*
- 4.4 *Manage navigation infrastructure to limit adverse impacts on coastal processes.*
- 4.5 *Ensure that expenditure of public funds for flooding and erosion control projects results in a public benefit.*
- 4.6 *Consider sea level rise when siting and designing projects involving substantial public expenditures.*

The Broadwater Project is consistent with and furthers the objectives of this policy through the preservation of existing near shore resources that provide protection from flooding and erosion. No aspect of the Project will have an impact that results in the increased likelihood of loss of life, structures and natural resources from flooding and erosion. There are no onshore structures that could result in measurable increases in erosion, flooding, or development that will be sited as part of this Project, as Broadwater proposes to use onshore facilities that take advantage of existing infrastructure within currently operable harbor areas. By using existing facilities, Broadwater is able to avoid digging and/or moving soils and clearing vegetation that are typically part of land development and construction. Broadwater's use of operable harbors also eliminates the need for new dredging or creation of additional navigation channels within the harbors of Long Island Sound. In addition, Broadwater does not propose construction or reconstruction of erosion protection structures. There will be no storage of materials that could generate an explosion that could result in loss of life, structures, or natural resources due to the unlikely result of flooding or erosion. As such, there will be no threats to life, structures or natural resources from flooding and erosion as part of the Project.

Broadwater's offshore facilities will also not result in hazards or threats to human and marine life, structures, and natural resources from flooding and erosion due in large part to its distant location in the central portion of the Sound. In the highly unlikely event of an incident on the FSRU, impacts that could occur include pool fires and vapor clouds that would be restricted to the central portion of the Sound. Since LNG is less dense than the Sound water, impacts would be restricted to the water's surface and the atmosphere directly above; according to the WSR, the principal characteristic of the consequence of a large release of LNG due to an accident or an attack is fire, not an explosion. WSR §§ 1.4.1, 8.2. Thus, there would be no physical disruption of significance that could increase flooding or erosion in coastal areas within the Sound

Construction of the proposed pipeline will involve installation of the pipeline below the seafloor, which will require trenching in coastal waters. The pipeline will be installed to an appropriate depth or covered with rock or concrete mattresses to ensure integrity. The

construction phase will not interfere in any way with natural coastal processes. Trenching will create a temporary and minimal disturbance of sediments, but nearshore areas will not be impacted. Modeling of the sediment generated from installation (*see* Resource Report No. 2, Water Use and Quality) demonstrates that nearshore areas will not be impacted by construction-related sedimentation.

The Project will also not result in interference with natural coastal processes that supply beach materials to land adjacent to such waters. Additionally, the Broadwater Project will not have any impact on coastal processes that could result in flooding and/or erosion and will safely accommodate the most severe weather data that can credibly occur in the area, including hurricanes. By siting in the central portion of the Sound, Broadwater avoids the need to require dredging or construction of other coastal structures that could affect the normal processes of the Sound, thereby resulting in increased flooding or erosion. Simply put, all natural coastline features that contribute to the Sound's protection will be preserved as a result of this privately funded Project.

For all of these reasons, the Broadwater project will be consistent with this policy.

**POLICY 5:** *Protect and improve water quality and supply in the Long Island Sound coastal area.*

- 5.1 *Prohibit direct or indirect discharges which would cause or contribute to contravention of water quality standards.*
- 5.2 *Manage land use activities and use best management practices to minimize nonpoint pollution of coastal waters.*
- 5.3 *Protect and enhance the use of coastal waters.*
- 5.4 *Limit the potential for adverse impacts of watershed development on water quality and quantity.*
- 5.5 *Protect and conserve the quality and quantity of potable water.*

The Broadwater Project is consistent with and furthers the objectives of this policy through specific design and operations to protect water quality in the Long Island Sound coastal area. Any and all discharges (both direct and indirect) to the Sound will comply with applicable standards, thus avoiding the potential for discharges to cause or contribute to contravention of water quality standards. The Broadwater Project will "not materially adversely affect receiving water quality." (LIS CMP at 78).

#### ***Broadwater is Protective of the Sound's Water Quality***

Broadwater completed a comprehensive literature review and field survey regarding Long Island Sound baseline conditions. The results of that baseline study are set forth in Broadwater's Environmental Sampling Report. (*see* Resource Report No. 2, Water Use and Quality). Broadwater's detailed water quality modeling demonstrates that construction will result in only minor, short term impacts to water quality. These short term impacts are not anticipated to substantially affect the overall water quality and supply in the Sound, or result in long term impacts to the water quality of the Sound as a result of the operation of the Project, including the LNG terminal, FSRU, LNG carriers transporting LNG to the Project.

Broadwater does not anticipate significant long-term Project-related impacts on water quality in Long Island Sound, and has taken a proactive approach to protecting Sound water resources both through design and long term operation of the Project. For example, high water usage is a common practice that may impact water quality at conventional LNG regasification facilities. However, for the initial design phase of the Project, Broadwater selected shell and tube vaporization (STV) to regasify the LNG. The STV design is a closed-loop system with minimal intake and discharge of large volumes of water. Broadwater has purposely selected a vaporization technology that greatly eliminates the need for intake and discharge of large volumes of water and which will not result in substantial temperature changes in Sound waters. In this manner and consistent with this Policy, the Broadwater Project preserves the Sound's water resources. As presented in Appendix A, Broadwater has examined all aspects of the operational phase of the FSRU to assure that anticipated discharges (both point and nonpoint) are protective of the existing water quality standards and will not result in any contravention of those standards.

The FSRU will be operated to minimize the occurrence of any fuel spills and non-point discharge of excess nutrients, organics, and eroded soils into coastal waters. This will be accomplished through adherence to an Spill Prevention Control and Countermeasure (SPCC) Plan, which will be implemented during construction and operation of the Project.

There are no anticipated long-term pollution impacts to the waters of the Long Island Sound or to the aquifers that provide the drinking water supply to the Long Island Sound region. Similarly, the Broadwater Project will not impact the quantity of potable water within the region. The water quality systems on board the FSRU have been designed to meet or exceed New York State Department of Environmental Conservation (NYSDEC) water quality criteria for physical as well as chemical parameters. All outfalls from the FSRU will be appropriately permitted through the NYSDEC to assure compliance with all applicable water quality standards. Broadwater has committed to using Membrane Bioreactor ("MBR") technology to treat all generated black and grey water. Furthermore, if through consultation with the NYSDEC it is determined that MBR discharge could not meet the Long Island Sound water quality (WQ) standards, all generated black and grey water would be containerized and shipped to shore for disposal at an approved treatment facility. In addition, effluent discharge is minimized and carefully controlled through design and best management practices (BMPs) and all point source discharges will be permitted through NYSDEC to assure adherence to applicable state water quality discharge requirements.

The Broadwater Project will result in the discharge of non-point source stormwater to the Sound; however, only uncontaminated stormwater will be allowed to drain freely overboard. The Broadwater design incorporates control structures to isolate deck areas that could be subject to minute quantities of soil and grease. Stormwater from these deck areas will be routed to the bilge tanks for appropriate disposal onshore.

Installation of a subsea pipeline also has the potential to impact water quality via resuspension and transport of sediments within Long Island Sound. Broadwater has conducted modeling to assess the potential dispersion of sediment resulting from construction. As demonstrated by this modeling, construction will result in only temporary increases in suspended sediment, primarily in the bottom of the water column, and visible at the surface. (*see* Appendix A and E, including sub-appendix A, to Resource Report No. 2, Water Use and Quality). Normal



tidal fluctuations in the Sound help dissipate the suspended sediments, with the isolated spikes in total suspended solids dissipated within 24 hours. Water quality impacts associated with resuspension could occur from disturbance of contaminated sediments during pipeline installation. Analysis of the water and sediment samples taken along the extent of the Project area indicate that no significant contamination exists within the Project area.

Broadwater anticipates using water from Long Island Sound for hydrostatic testing of the subsea interconnection pipeline that will connect the FSRU to the Iroquois Gas Transmission System (IGTS) pipeline. Once hydrostatic testing is successfully completed, a drying agent will be used to dry the pipeline. The drying agent will not be discharged from the pipeline to the environment; it will be recovered and returned to the vessel for recycling or disposal.

As the proposed Project is located entirely within Long Island Sound, no known groundwater or wetland resources will be affected by installation or operation of the Project. In addition, siting the FSRU in the deeper central waters of the Sound avoids the need for inshore dredging and disposal. For onshore facilities that have been identified for use as warehousing, office and general support facilities, Broadwater will minimize the occurrence of any spills and non-point discharge of excess nutrients, organics, and eroded soils into coastal waters. This will be accomplished through adherence to an SPCC, which will be implemented during construction and operation of the Project. Additionally, Broadwater will have no impact on the quantity of any potable water supplies in the vicinity of the onshore facilities at Port Jefferson or Greenport and as such will protect and conserve potable water sources.

***Broadwater is Consistent with the Water Quality Objectives of the Long Island Sound Study Comprehensive Conservation and Management Plan***

Broadwater has also considered the goals and objectives of the LISS Plan and will be fully consistent with the recommendations and targets established therein. A discussion of the LISS Plan and the Broadwater Project's consistency with it is set forth below.

The LISS Plan identifies six issues requiring special attention: (1) low dissolved oxygen levels (hypoxia), (2) toxic contamination, (3) pathogen contamination, (4) floatable debris, (5) living resources and habitat, and (6) land use and development. The plan describes ongoing programs and LISS's commitments and recommendations for actions that specifically address the Sound's priority problems. In 2003, the EPA and the states of New York and Connecticut signed the Long Island Sound Agreement, which builds on the goals of the 1994 LISS Plan by adding 30 new goals and targets to restore Long Island Sound. As discussed below, the placement of an FSRU and associated subsea pipeline in the Sound would not conflict with any management objective being implemented or the 30 specific goals implemented by the LISS Plan. Broadwater designed the Project to minimize impacts to the extent practicable and to ensure that the Sound continues to function as a resource of regional significance.

- Hypoxia. The discharge of excessive amounts of nitrogen is the primary cause of hypoxia in Long Island Sound. This impact is a primary concern in the western portion of the Sound and in some central portions during the warmer summer months. The concern is highest for waters close to areas with high population densities, where the associated discharges to

the Sound (e.g., sewer overflows) often contain elevated levels of contaminants that increase the biological oxygen demand (BOD) in the Sound's waters. Oxygen levels in the Sound also can be affected by runoff from agricultural areas, which may contain excess fertilizers. Broadwater designed the FSRU to minimize wastewater discharge to the Sound, and all discharges will be in accordance with applicable water quality regulations. Waste water generated on the FSRU will be treated prior to being discharged and will not have a BOD greater than 50 milligrams/liter (mg/L). If water quality discharge standards cannot be achieved, Broadwater will ship wastewater to shore for disposal at an approved facility. Based on the results of the spring 2005 field sampling, no significant BOD was identified in the Project area. Therefore, any potentially elevated BOD levels associated with FSRU discharges would be readily assimilated by the Sound. In addition, since all discharges from the FSRU would occur near the surface, any discharges from the FSRU would not cumulatively impact hypoxic conditions, which are concentrated at or near the bottom in deeper water.

- Toxic Contamination. The primary sources of toxic substances entering the Sound are industrial complexes along the major tributaries of the Sound (i.e., the Connecticut, Housatonic, Quinnipiac, and Thames Rivers), sewage treatment facilities, and urban runoff. The location of the FSRU in the central portion of the Sound is unrelated to specific impacts resulting from onshore point-source contamination. Broadwater has analyzed the existing water quality and sediment quality conditions within the Project area, based on the spring 2005 field surveys. Based on Broadwater's sampling results, no action levels for any contaminants of concern are exceeded in the Project area. (See Appendix A and Resource Report No. 2, Water Use and Quality).
- Implementation of storm water management controls and spill prevention and countermeasure procedures will minimize the potential release of fuels and other lubricants into the water column. As part of the Project, a site-specific SPCC Plan for all Project-related activities will be developed.
- To the extent that accidental discharge of LNG to the Sound has been identified as a potential concern, any LNG accidentally discharged to the Sound would float on the surface and completely evaporate, leaving no residue and eliminating potential contamination of marine resources. Therefore, even in the unlikely event of an incident resulting in an LNG discharge, such incidents would not pose the potential human health and environmental threats generally recognized and associated with petroleum spills. While there will be air emissions associated with operation of the FSRU, all facility emissions will be in accordance with state and federal regulations and will be subject to review by NYSDEC and the U.S. Environmental Protection Agency (EPA).

- **Pathogen Contamination.** Pathogens enter Long Island Sound from untreated or inadequately treated human sewage and wild and domestic animal waste. Vessel sewage discharge has been identified as one of four pathogen sources warranting primary management actions. As part of the 2003 Agreement, efforts are being made to designate all Sound embayments in New York as vessel no-discharge areas. This and other pathogen-release management actions focus on nearshore areas, where the introduction of pathogens has the greatest potential to adversely affect aquatic life and public health. Based on its offshore location, operation of the FSRU will have no effect on current or planned pathogen management activities. The FSRU design incorporates appropriate treatment of waste prior to discharge, and all discharges will be in accordance with applicable water quality regulations. If water quality discharge standards cannot be achieved, Broadwater will ship wastewater to shore for disposal at an approved facility. In addition, all vessels berthing at the LNG terminal will be required to comply with the requirements of MARPOL (International Convention on the Prevention of Pollution from Ships). No waste will be discharged from the LNG carriers within Long Island Sound.
- **Floatable Debris.** All waste generated at the FSRU will be properly disposed of in accordance with state and federal permit regulations, and no unauthorized release of floatable debris into the Sound will occur. With regard to waste handling, the same practices as developed for offshore oil production facilities will be incorporated into the Broadwater waste management plan.
- **Living Resources and Habitat.** Besides water pollution, destruction and degradation of habitat and over-harvesting from fishing are identified as the primary threats to living resources and habitats in Long Island Sound. Management activities to preserve and enhance living resources focus on nearshore areas and include protection and restoration of tidal wetlands, intertidal sand and mud flats, and submerged aquatic vegetation. Broadwater sited the FSRU and interconnecting pipeline in the central portion of the Sound to avoid impacts on critical inshore resources. While impacts will occur in the central portion of the Sound from installation of the Project, no inshore coastal habitats will be impacted.

Installation of the pipeline and FSRU mooring structure will result in both positive and negative impacts on the existing resources of Long Island Sound. Installation of the mooring structure will affect approximately 13,180 square feet (1,225 m<sup>2</sup>) of seafloor. This impacted area is relatively insignificant in terms of the overall substrate available in the Sound. Moreover, following installation, the mooring tower will actually increase habitat diversity by providing vertical structure, which is currently absent from the central portion of the Sound, and does not offer any unique or high quality habitat. Construction of the Project will result in the short-term displacement of the bottom habitat as the pipeline is installed below the seafloor; however, native communities will be allowed to reestablish following completion of construction. Scheduling installation during the winter months will further reduce impacts by

largely avoiding breeding activities and by avoiding the summer season, when a greater number of migratory populations utilize the Sound. Additional discussion of potential impacts on living marine resources is set forth in Appendix B.

As demonstrated above, Broadwater will take all necessary steps to ensure the maintenance of the water quality of the Long Island Sound. For these and all the other foregoing reasons, the Broadwater Project will be consistent with this policy.

**POLICY 6:** *Protect and restore the quality and function of the Long Island Sound ecosystem.*

- 6.1 *Protect and restore ecological quality throughout Long Island Sound.*
- 6.2 *Protect and restore Significant Coastal Fish and Wildlife Habitats.*
- 6.3 *Protect and restore tidal and freshwater wetlands.*
- 6.4 *Protect vulnerable fish, wildlife, and plant species, and rare ecological communities.*
- 6.5 *Protect natural resources and associated values in identified regionally important natural areas.*

The quality and function of the Long Island Sound ecosystem depends on both physical and biological components, including geology, soils, water, marine habitats, and marine species. The Broadwater Project is consistent with this policy, protecting the quality and function of the Long Island Sound ecosystem. Appendix B provides a discussion of both the existing resources within the Sound, and the anticipated short term and manageable impacts resulting from implementation of the Broadwater Project.

The FSRU's proposed offshore location and design are protective of Long Island Sound's environmental and biological components, largely preserving and protecting the ecological quality of Long Island Sound. Broadwater's use of existing onshore facilities is similarly protective of the environmental components of Long Island Sound, by avoiding additional, new development on Long Island's coast. The benefits of Broadwater's preferred alternative upon the Long Island Sound ecosystem, and the explanation of the Project's conformance with this policy are set forth below.

Long Island Sound's biological marine ecosystems are dependent on the water and underlying sediments for food, shelter, and breeding habitats. In order to preserve the Sound's water quality, Broadwater is proposing to use an FSRU with STV design. The STV design is a closed-loop system that avoids the need for large volumes of water required by other LNG technologies, such as Open Rack Vaporization (ORV).

By siting well offshore, Broadwater avoids the critical inshore coastal areas recognized for their value in providing the greatest biological diversity in the Sound. Broadwater avoids critical spawning and nursery grounds concentrated in shallower in-shore waters. The proposed Project is located in deep water near the center of Long Island Sound, away from shallow nearshore areas designated by NYSDOS as Significant Coastal Fish and Wildlife Habitat (SCFWH). The largely homogeneous substrate in the central portion of the Sound provides no unique habitats for Long Island Sound species. All inshore SCFWHs are avoided. The only SCFWH traversed by the Project is the Race, which would be affected only

by LNG carrier traffic. This traffic is consistent with the current commercial traffic which also traverses the Race and would not result in any direct impact to the resource. This is similarly described in the WSR. The passage between Race rock light and Valiant rock is the route through the Race that would be utilized by LNG carriers. This is a mixed use area consisting of commercial deep draft tug and barge traffic, commercial ferries, charter fishing boats and recreational vessels. WSR § 3.2.5.2.1. The U.S. Fish and Wildlife Service (USFWS)- and Long Island Sound-designated significant habitats are also largely restricted to near shore and coastal areas and therefore are not impacted by the Project. The Broadwater Project is consistent with this policy because there are no freshwater wetlands or National Wetlands Inventory (NWI) wetlands within or adjacent to the proposed locations for onshore facilities. *See* Broadwater's Onshore Facilities Resource Reports, section 3.1 at 3-1 and 3-8, annexed as Appendix O. Due to the location of the FSRU and interconnection pipeline offshore, these facilities will also not impact any wetlands.

Use of Sound water will result in impingement and entrainment of Long Island Sound planktonic organisms. Broadwater evaluated existing ichthyoplankton data collected as part of the Poletti Power Project, and has undertaken an additional ichthyoplankton sampling at the proposed FSRU location. Results of these analyses demonstrate that the ichthyoplankton impacts resulting from the Project will not have a material negative effect on existing vulnerable communities within the Sound. Construction of the offshore pipeline will mainly result in short-term impacts on marine habitats and all disturbed areas are expected to return to preconstruction conditions following completion of construction. *See* Broadwater's response to LIS CMP Policies 5 and 11; *see also* Appendix B, section 1.2. Marine species that may be impacted by construction of the Project are those associated with benthic habitats, including demersal finfish, shellfish, early benthic-phase lobsters, and benthic communities. Broadwater expects these impacts to be short term and minor since benthos recolonization is expected to occur within months of construction completion, and bottom habitat will return to preconstruction conditions. Several threatened and endangered mammal, fish, and reptile species are known to occur in the Project area. Impacts on these species are anticipated to be minimal.

Impacts on Essential Fish Habitat (EFH) during construction of the pipeline route and FSRU could result from increases in turbidity levels and suspended solids and temporary disturbance of bottom habitat. Because natural sedimentation and benthic recolonization is expected to occur within months immediately following construction activities, disturbance to EFH is anticipated to be short term and minor, and healthy, fully functioning ecosystems would be expected to reestablish following the installation of the pipeline.

There is no Endangered Species Act (ESA) designated critical habitat within the Project area. In addition, there are no tidal or freshwater wetlands located in the Project area. Expected safety and security zones surrounding the FSRU and a stationary tower structure will create a protected area free from ongoing fishing pressures, which will likely enhance the ecosystem in immediate proximity to the FSRU. Broadwater does not anticipate encountering bedrock along the pipeline route; therefore, no underwater blasting is proposed. The FSRU will be secured in place in Long Island Sound via a yoke mooring system (YMS), which will be anchored to the seafloor by a tower structure. The tower will have a footprint on the seafloor of the Sound of approximately 7,000 square feet, which represents a small portion of the overall seafloor of the Sound.

The proposed Project will not involve the discharge of untreated contaminants into coastal waters. All wastewater generated at the proposed facility will be diverted through an appropriate treatment system prior to being discharged. All discharges from the facility will be in accordance with state water quality standards. No waste discharged to the Sound will occur from the LNG carriers associated with the Project.

Normal operation of the FSRU will require the use of water for ballasting and daily operations. LNG carriers servicing the facility will also need to use Sound water for cooling water while moored at the facility. Potential operational impacts on marine habitats include the introduction of non-native species by LNG carriers and effects on marine life from ballast water intake. Potential impacts will be minimized to the extent practicable through appropriate FSRU design and mitigation measures, including the following: minimization of water intake velocities to 0.5 ft/s (0.15 m/s), use of 5 mm screening to prevent entrainment of larger organisms, and locating intake structures for the FSRU and LNG carriers in the middle of the water column (approximately 28-40 feet) to avoid high planktonic densities that occur at the surface and on the bottom.

Changing FSRU ballast water prior to arriving in Long Island Sound will reduce the potential for transfer of non-native organisms. During the operational phase, the FSRU placement will be fixed, and therefore the exchange of ballast water should not introduce non-native species. LNG carriers will not discharge ballast water in the Sound but will take in ballast water while unloading LNG to compensate for the decreased weight and to maintain stability. Intake water systems will utilize screens to control the entrainment of debris and fish into the ballast system.

There will be a minimal potential risk of ignition of an LNG carrier while in transit or moored at the FSRU that could potentially cause a threat to Long Island Sound's ecosystems. The LNG carriers will be constructed to meet all U.S. and international standards and, when at port, safety and security zones will be enforced. The Project is being designed with many levels of spill prevention in place to ensure that an LNG spill does not occur. Broadwater completed a safety and reliability assessment to address potential disaster scenarios that could impact coastal resources. Potential hazards evaluated by Broadwater include pool fires, flammable vapor clouds, and rapid-phase transition, in addition to terrorist-related threats to shipments and LNG vessels. In addition, to mitigate potential safety and security risks associated with the project, the USCG proposed, among several other mitigation measures, to promulgate safety/security zones for the FSRU and the LNG carriers. The primary purpose of the safety/security zones is to reduce risks to the public by limiting access to the areas of highest consequence should an LNG fire occur and to provide a security perimeter to protect the FSRU and LNG carriers.

Multiple levels of safety also will be in place to prevent problems from escalating beyond the immediate area, including radar and positioning systems to alert crew to traffic and other hazards around the vessel; primary and secondary barriers on storage tanks to prevent leakage or rupture; leak detection and mitigation through continual monitoring and emergency shutdown procedures; and establishment of a safety zone that extends beyond the FSRU and carriers. The results of Broadwater's safety and reliability assessment are contained in Resource Report No. 11, Safety and Reliability. In addition, an emergency response plan will be in place to address potential hazards and disasters. This plan will be consistent with those



recommendations made in the WSR. Similarly, there is no basis for concern that the ignition of Broadwater's onshore facilities could possibly produce significant adverse changes to Long Island Sound's ecosystem, as Broadwater will not store materials capable of producing such result at its on-shore water-dependent facilities. In addition, Broadwater's tugs will be fueled directly from road tankers at the onshore site. There will be no bulk storage of fuel at Broadwater's onshore locations. (see Onshore Facilities Resource Reports, Appendix O). In the unlikely event of an emergency event on a tug, Broadwater's tug boats will be equipped with fire-fighting equipment.

For all the foregoing reasons, the Broadwater Project will be consistent with this policy.

**POLICY 7:** *Protect and improve air quality in the Long Island Sound coastal area.*

- 7.1 *Control or abate existing and prevent new air pollution.*
- 7.2 *Limit discharges of atmospheric radioactive material to a level that is as low as practicable.*
- 7.3 *Limit sources of atmospheric deposition of pollutants to the Sound, particularly from nitrogen sources.*

The Broadwater Project is consistent with and furthers the objectives of this policy, as the Project will be consistent with all applicable state and federal air quality requirements. The Broadwater Project also brings the opportunity to enhance regional air quality through the introduction of additional, clean-burning natural gas into the region. Cleaner burning natural gas supplied by the Project will be available to replace coal and oil fuels currently serving much of the Region's energy needs. New or existing power generation, residential heating, and environmental/industrial applications will be able to take advantage of the availability of natural gas that is currently in limited supply. The switch to use of natural gas from coal and oil will result in lower emissions resulting in less deposition of acid rain precursors and nitrogen sources, such as oxides of nitrogen (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>), into Long Island Sound. In addition, Broadwater's incorporation of lowest achievable emission rate (LAER) technology and best available control technology (BACT) into the FSRU design (through the use of low-NO<sub>x</sub> burners, selective catalytic reduction, and oxidation catalysts for each process heater and turbine) minimizes emissions of NO<sub>x</sub>, carbon monoxide, and volatile organic compounds from the Project. Broadwater also has evaluated LNG carrier emissions to assist the Federal Energy Regulatory Commission (FERC) in evaluating the Project for compliance with general conformity requirements. Throughout the Project authorization process, Broadwater is coordinating closely with the U.S. Environmental Protection Agency (EPA), NYSDEC, and FERC regarding applicable air permitting and general conformity review requirements and, if applicable, any emission offsets needed to mitigate air emissions from the Broadwater Project.

Construction of the Broadwater Project is expected to have minor, short-term effects on regional air quality as described below. Broadwater's anticipated construction schedule is as follows: (i) pre-construction survey and mobilization -- September and October 2009; (ii) main pipe lay for interconnection pipeline to IGTS -- October 2009 to April 2010; (iii) setting YMS jacket and driving piles -- October - December 2010; and (iv) remaining tie-ins,

testing and commissioning -- November - December 2010. During the construction period, air emissions from the construction vessels (lay barges, pipe barges, and supporting vessels) will add to regional emission levels. The ambient effects from these vessels will be minor and temporary, and their effects will be minimized through the use of pollution control equipment and other mitigation measures. In addition, Broadwater intends to complete the majority of construction during non-summer months (i.e., October - April) assuming no weather delays. As a result, associated emissions are not expected to occur during (or contribute to) the summertime ozone season. Construction and emissions (including visible emissions) from the equipment will quickly dissipate, and because most construction-related emissions will occur several miles from shore, the effects on onshore areas will be minimal, if any.

Emissions-generating equipment on the FSRU, including process heaters and generators, will be evaluated under NYSDEC's preconstruction permitting program and also may be subject to EPA's program. While moored, a portion of emissions-generating equipment on the LNG carrier also will be modeled under NYSDEC's program (and, if applicable, EPA's program). Emissions generated by the FSRU during operations will be subject to the terms and conditions prescribed in the Title V operating permit issued to the Broadwater Project by NYSDEC.

The determination of the impacts of the emissions associated with the Broadwater Project has been accomplished through atmospheric dispersion modeling performed in accordance with applicable NYSDEC/EPA requirements. This modeling demonstrates that the emissions from the Broadwater Project will have only minor impacts on the Long Island Sound coastal area.

The only other emissions from operation of the Broadwater Project will be those of the LNG carriers as they transit the Sound to and from the FSRU. These emissions will not, however, occur continuously since the LNG carriers will travel to and from the FSRU on a staggered schedule. These emissions also will be subject to General Conformity requirements and, if necessary, will be offset through the use of Emission Reduction Credits or other emission offsets acceptable to NYSDEC and EPA.

Additional information regarding the existing air quality conditions of the region and the Project's anticipated impacts on air quality are contained in Appendix C.

**POLICY 8:** *Minimize environmental degradation in the Long Island Sound coastal area from solid waste and hazardous substances and wastes.*

- 8.1 *Manage solid waste to protect public health and control pollution.*
- 8.2 *Manage hazardous wastes to protect public health and control pollution.*
- 8.3 *Protect the environment from degradation due to toxic pollutants and substances hazardous to the environment and public health.*
- 8.4 *Prevent and remediate discharge of petroleum products.*
- 8.5 *Transport solid waste and hazardous substances and waste in a manner which protects the safety, well-being, and general welfare of the public; the*

*environmental resources of the state; and the continued use of transportation facilities.*

The Broadwater Project is consistent with and furthers the objectives of this policy, because the Broadwater Project is designed to minimize generation of solid wastes and hazardous wastes and substances and, where such wastes and substances are produced, to contain and properly dispose of them. There are unlikely to be any threats to human safety or Long Island's coastal resources as a result of contamination from the Project. As such, the Project is consistent with this policy.

There will be no discharge of solid or hazardous waste to the waters of the Long Island Sound due to the operation and construction of the Broadwater Project. All solid waste generated on board the FSRU will be containerized and shipped to shore for appropriate disposal at an approved facility.

Containerized wastes will be transferred to utility boats and secured prior to departure from the FSRU. The transfer of waste material from the FSRU will have no adverse affects on other users of the Sound, as utility type boats are commonplace in the Sound. At the waterfront facility, waste materials will either be directly loaded onto trucks to be hauled off-site, or will be temporary stored in their containers until they can be loaded onto trucks.

While hazardous materials will be required for routine operations on the FSRU, these materials will be properly managed to prevent discharge to the Sound. Aqueous ammonia and odorant (mercaptan or similar) will be the two primary bulk materials used during the operation of the FSRU that will require regular transshipment. Mercaptan will be transported and stored using approved ISO tanks, which are commonly used for the intermodal transport and storage of freight. These containers are issued with a container safety certificate provided by the manufacturer that must be renewed every 30 months after a review by a certified inspector. These reviews will ensure the structural integrity of the container thereby, minimizing the potential for spills and associated releases to the aquatic environment. On-deck facilities requiring maintenance (i.e., oiling and greasing) will be contained so that stormwater can be routed to appropriate holding tanks and shipped to shore for disposal.

To allow for black start of FSRU equipment, the FSRU will require the storage of marine grade diesel. Storage tanks for this fuel will be integrated into the hull of the FSRU. This onboard diesel will minimize the need to frequently resupply the FSRU's fuel source and will avoid the inadvertent release of diesel into Long Island Sound.

In the event of unanticipated releases of LNG from the FSRU or LNG carriers, such releases would vaporize almost instantaneously, creating only minimal short term impacts with no long term residual impacts.

In addition to the Broadwater Project's design and containment measures that will limit the potential for discharges of solid or hazardous wastes from the on and offshore facilities, Broadwater is developing a site-specific SPCC for all project-related activities. Broadwater will also develop a Facility Response Plan to address unlikely scenarios of releases to the Sound. This plan will be reviewed and approved by the U.S. Coast Guard and NYSDEC prior to initiation of facility operations.

For all these reasons, the Broadwater Project is consistent with this policy.

**POLICY 9:** *Provide for public access to, and recreational use of, coastal waters, public lands, and public resources of the Long Island Sound coastal area.*

- 9.1 *Promote appropriate and adequate physical public access and recreation throughout the coastal area.*
- 9.2 *Provide public visual access from public lands to coastal lands and waters or open space at all sites where physically practical.*
- 9.3 *Preserve the public interest in and use of lands and waters held in public trust by the state, New York City, and the towns of Nassau and Suffolk counties.*
- 9.4 *Assure public access to public trust lands and navigable waters.*

Broadwater is consistent with and furthers the objectives of this policy because the introduction of the much-needed, new energy source from overseas into the target markets using the preferred siting location, design, and technology will not impact public access to the onshore public lands and public resources of the Long Island Sound coastal area. In addition, the Broadwater Project will substantially preserve public access to, and recreational use of, coastal waters with limited, primarily temporary restrictions on public access that are resoundingly outweighed by the demonstrated need for a new energy supply in the region and to adequately provide for the safety of the public. The Broadwater Project has been proposed in a location and has adopted a design that will avoid and minimize impacts to other commercial and recreational water-dependent users of Long Island Sound compared to potential impacts that would result from other alternatives, most notably those involving onshore siting. Where, as here, there is an overarching public benefit from a project that will only marginally affect public access to and commercial and recreational uses of coastal waters, public lands, and public resources, the project is consistent with the objectives of the public trust doctrine. The Broadwater Project concurrently advances the public interest by providing a solution to increasing regional energy demands while substantially preserving public access and recreational and commercial uses within the Sound. For these reasons, which are discussed in greater detail below, the Broadwater Project is consistent with the objectives of this policy.

***With the Broadwater Project, There Will Be Adequate Physical Public Access and Recreation Throughout the Coastal Area***

The Broadwater Project is consistent with the goals of this policy because it respects the importance of maintaining existing physical public access to coastal areas. Importantly, the construction and operation of the Broadwater Project will not result in restrictions to existing physical access areas of coastal lands or the shoreline of Long Island Sound. And because the Broadwater Project will locate its onshore support facilities at existing commercial/industrial properties that are not proximally located near public access areas that are used to reach the coast or water, the Broadwater Project will not impact or diminish existing or future opportunities for physical access to Long Island's publicly owned foreshore, water's edge, or publicly owned lands adjacent to these areas. Moreover, Broadwater is establishing and funding a Social Investment Program that will work with various state agencies, municipalities, and not-for-profit organizations to identify and support projects and programs that promote and

provide for public access to, and recreational use of, coastal waters, public lands, and public resources of the Long Island Sound coastal area.

Minimal marine use conflicts may result from the construction and operation of the Broadwater Project. Such potential conflicts, however, are countered by the need for the Broadwater Project and the continued availability of appropriate and adequate physical public access and recreation to the Sound. There are nearly 1,320 square miles of water within the Sound. WSR § 8.2. Correspondingly, there are a multitude of locations and areas within the Sound that will remain available for public access and recreation -- without any restrictions whatsoever -- when the Broadwater Project becomes operational. To the extent that there are restrictions of certain portions of the Sound, those restrictions will be primarily of limited size and duration. The primary restrictions facing other water dependent users of the Sound will result from U.S. Coast Guard-designated safety and security zones that will "travel" with LNG carriers transiting to and from the FSRU. The U.S. Coast Guard-imposed safety and security zone around the FSRU will not measurably impact the Sound. The recommended 1,210 yard safety and security zone around the FSRU would affect only 0.12% of the approximately 1,320 square miles of total navigable water in Long Island Sound. *Id.* In addition, the recommended safety/security zones around the LNG carriers while in transit in Long Island Sound will be temporary and are not expected to last longer than 15 minutes at any location.

During the siting process for the Project, Broadwater gave the highest consideration to selecting a location and design for the LNG terminal that substantially preserves public access to and along the coast and within Long Island Sound's waters and minimizes conflicts with other existing water-dependent users of the Sound. Broadwater completed a comprehensive, comparative analysis for multiple sites in Long Island Sound, both on-and offshore. The Broadwater Project in its current location and configuration represents the area within the Sound that is the most protective of other commercial, industrial, and recreational water-dependent users within the Sound and results in the least conflict with such other users. Broadwater's analysis of the most likely and reasonable alternatives is set forth in Section 2.2.

### ***The Broadwater Project's Compatibility With Existing Uses Within Long Island Sound***

#### ***Analysis of Recommended U.S. Coast Guard Safety and Security Zone***

Broadwater's analysis of the potential use conflicts resulting from the construction and operation of the FSRU, LNG carrier routes and associated safety and security zones with other water-dependent uses confirms that the Broadwater Project is consistent with the objectives and goals of continuing public access to, and recreational use of, coastal waters, public lands, and public resources in the Long Island Sound coastal area. The U.S. Coast Guard recommended safety and security zones for the FSRU and LNG carrier in the WSR §§ 4.6.1.5, 5.5.5, 8.2. The recommended safety and security zones will be approximately 1,210 yards as referenced to the center of the mooring tower for the FSRU and 2 miles ahead, 1 mile behind, and 750 yards to either side for the LNG carrier. WSR §§ 4.6.1.4., 5.5.5. Broadwater has addressed the potential effects of these recommended safety and security zones on existing commercial and recreational marine uses.. The establishment of the safety and security zones by the U.S. Coast Guard are federal activities and as such will be subject to the U.S. Coast Guard's consistency review and standards under 15 C.F.R. Part 930, Subpart C.

### ***Potential Marine and Land Use Conflicts With the Broadwater Project***

Broadwater's analysis of potential use conflicts also incorporates and relies upon the Coast Guard's recommended 1,210 yard safety and security zone and an economic impact study completed by Broadwater that identifies potential public access conflicts that may result between marine and onshore uses with the Broadwater Project. Broadwater completed this analysis as part of its due diligence evaluation relative to the coastal zone consistency determination and certification process. Certain aspects of Broadwater's economic analysis were completed at the direction of the NYSDOS. The purpose of this analysis is to investigate whether potential conflicts resulted in economic losses to commercial fishing (lobster fishery, finfish fishery), recreation and tourism, navigation, and vessel traffic industries, and, if so, to what extent. The primary results of the Broadwater Marine/Land Use Compatibility Assessment and related economic analysis are provided below. A complete copy of the Economic Impact Study is attached as Appendix F. A complete copy of the Marine/Land Use Compatibility Assessment is attached as Appendix E.

Broadwater's analysis of the Project (during both the construction phase and operating periods) relative to existing uses of marine and coastal resources within Long Island Sound establishes the Project's consistency with this policy, as more fully set forth below.

#### ***Commercial Fishing***

The commercial fishing industry, which involves all portions of Long Island Sound, provides many jobs and contributes millions of dollars to the economies of both New York and Connecticut. Commercial fishing in the Sound targets both finfish and shellfish (including bivalves and the American lobster). Hard clams and Eastern oyster are the most actively fished commercial species in the region, accounting for more than 74% of the total revenues in 2001. Given Broadwater's location in the deeper waters of the central Sound, impacts to the hard clam and oyster industries, which are located primarily in the shallower waters nearer to shore are avoided, thus preserving the most economically important component of the commercial fishery.

#### ***Lobster Fisheries***

Historical use maps of the area where the FSRU and interconnection pipeline will be located are classified as a high-use lobster fishery area. As a result, Broadwater completed an analysis to estimate the potential conflicts with the lobster industry and estimate any potential, resulting economic losses.<sup>8</sup> Based on data and assumptions that were used to estimate the value of lobster landings, Broadwater's impact estimates to lobster fisheries are predicated on the recommended U.S. Coast Guard safety and security zone area extending 1,210 yards from the FSRU mooring tower and cover the time period from 2010 to 2040. Further explanation of the assumptions and parameters used to estimate lobster impacts are provided in the Broadwater Economic Impact Study (*see* Appendix F).

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<sup>8</sup> Broadwater will compensate displaced fishermen and lobstermen for demonstrated losses of income as a result of the Broadwater Project.



### ***Economic Effects of Potential Lobster Fisheries Conflicts***

Estimates were made on the future annual landings of lobster for the recommended safety and security zone. Detailed procedures and methodologies employed for this study, which addresses the value of average landings and density of lobster pots in Long Island Sound, are provided in Appendix B. It is important to note that the economic studies conducted for the Broadwater Project are Sound-wide analyses with no artificial constraints associated with the New York/Connecticut state line. Figure 39 shows the area to be covered by the recommended U.S. Coast Guard safety and security zone.

Using average annual landings and a potential range of lobster pots per trap line in Long Island Sound, the analysis suggests that a restricted access area of 1,210 yards from the center of the mooring tower would correspond to annual lobster landings valued at between approximately \$8,000 and \$32,000 per year depending on the number of pots attached to a trap line. In other words, for 15 pots per trap line, the annual value of landings would correspond to approximately \$24,000 (*see* Table 35).

**Table 35 Direct Economic Impacts-Summary Analysis  
Based on Range of Lobster Pots per Trap Line**

Pots per Trap Line	Yards from Mooring Tower
	1,210
<b>Value of Average Annual Landings (2010-2040)</b>	
5	\$8,042
10	\$16,084
15	\$24,126
20	\$32,168
<b>Cumulative Present Value of Future Annual Landings (2010-2040)</b>	
5	\$130,224
10	\$260,447
15	\$390,671
20	\$520,894

To assess the corresponding estimated lost revenue to area commercial lobstermen, Broadwater compared this data to recent estimates of the total value of lobster landings for the eastern Long Island Sound region, the entire Long Island Sound, and New York State.

Broadwater also estimated the indirect and induced impacts for the purpose of identifying the scope and magnitude of potential conflicts with the lobstering industry. Direct expenditures have an indirect economic impact or stimulus on the suppliers and firms that are the recipients of these subsequent rounds of spending. In addition, employees and households that earn wages from these industries are also impacted by these expenditures and they in turn spend a portion of their incomes in New York State. These latter impacts are called induced effects. The direct, indirect, and induced impacts are summed and collectively are called total economic

impacts. The indirect and induced impacts represent the multiplier or ripple effects that are generated from the initial direct expenditures from the lobster landings revenues.

The economic impacts associated with the potential loss of lobster revenues for the recommended U.S. Coast Guard safety and security zone were estimated for an average year and also over the anticipated long-term, 30 year operational life of the Broadwater Project. The long-term impacts were estimated for each year over the life of the Broadwater Project and also expressed as a cumulative present value sum. The cumulative present value sum is a measure of the total long-term impact in present worth terms. Table 36 summarizes the estimated economic impacts for the safety and security zone broken down into the following components: the annual total industry output, the broadest measure of total economic impacts for an average year and the cumulative present worth measured over the 30 year economic life of the project; the impacts to employee compensation; total value added; and employment. With the recommended 1,210 yard safety and security zone established for the Broadwater Project, the total economic impact to the commercial lobster fishing industry (accounting for potential losses through 2040) is estimated at approximately \$649,000.

**Table 36 Summary of Economic Impacts to NYS Associated with Ocean Area Sizes Equivalent to the FSRU Safety and Security Zone-Average Year and Long-Term Cumulative Impacts**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
	Safety and Security Zone Alternative 1,000	1,000
<b>Total Industry Output</b>		
Direct	\$24,126	\$324,969
Indirect	\$9,333	\$125,717
Induced	\$14,706	\$198,089
Total	\$48,166	\$648,775
<b>Employee Compensation</b>		
Direct	\$5,585	\$75,231
Indirect	\$3,227	\$43,460
Induced	\$4,669	\$62,894
Total	\$13,481	\$181,585
<b>Total Value Added</b>		
Direct	\$15,013	\$202,222
Indirect	\$5,386	\$72,547
Induced	\$9,471	\$127,570
Total	\$29,870	\$402,340
<b>Employment</b>		
Direct	1.3	40
Indirect	0.1	2
Induced	0.1	4
Total	1.5	46

### Commercial Finfishing

Broadwater also conducted an analysis of potential effects of the Broadwater Project on the commercial finfishing industry. Based on information obtained from local

fishermen and available fishery data, the transitional and mud bottoms of the Sound attract a high number and diversity of fish. Consistent with the information in the Lobster Fisheries section above information provided by local fishermen indicates that nearly the entire western two-thirds of the Sound, including the location for the FSRU and interconnection pipeline is a high-use lobster fishery area. As a result of the high density of lobster traps in New York waters throughout the central and western basins of the Sound, commercial finfishing is currently limited in the Broadwater Project area.

Broadwater also completed a fishermen outreach program to identify potentially interested parties that use the Sound for commercial and recreational fishing and to identify those who may be impacted by the construction and/or operation of the Broadwater Project. Information obtained from commercial and recreational fishermen through a telephone survey included: areas fished in Long Island Sound, targeted species, gear type, seasons fished, and concerns, if any, related to the proposed Broadwater Project. The outreach program also included a review of information provided by NOAA Fisheries related to catch in the Broadwater Project area.

The results of Broadwater's survey and analysis of fishery data and the fishermen outreach program are fully set forth in Appendix H. The primary information from that data and outreach program is summarized below.

### ***Trawling Lanes***

In general, trawling is limited in the Sound due to the predominance of fixed-gear commercial lobster fishing. In order to avoid conflict between fishermen using fixed gear and fishermen who trawl, specific areas have been agreed upon as trawling lanes. Trawling lanes were identified during the initial consultation with local fisherman and are consistent with information presented in the *Environmental Impact Statement for the Designation of Dredge Material Disposal Sites in Central and Western Long Island Sound, Connecticut and New York* (EPA 2004). Designated trawling lanes in Long Island Sound are shown on Figure 40.

The FSRU and the recommended 1,210 yard safety and security zone will likely result in the elimination of some available commercial fishing grounds to finfish. While some limited access to the safety and security zone may be permitted by the U.S. Coast Guard, potentially reducing any resulting impacts, for the purposes of this analysis, Broadwater has assumed (without agreeing) that the establishment of a safety and security zone around the FSRU will prohibit any access by fishermen, thus providing the most conservative assessment. The WSR identifies one trawl lane approximately 61 yards north of the proposed FSRU location. WSR § 3.1.2.3.1. A second trawl lane is located in Connecticut State waters running approximately 2.3 to 5.4 miles offshore between Guilford, Connect and Milford, Connecticut. Id. According to the WSR, "[v]ery few commercial trawl fishing vessels utilize these lanes. It is estimate that at most 6 trawlers utilize these lanes; generally, fishing occurs in summer, primarily during the month of August." Id.

As discussed below, the projected economic losses associated with the Broadwater Project are not significant in terms of the overall finfishing industry production. The economic impacts to the commercial finfishing industry are more than offset when compared to the overall economic benefits that will result from the construction and operation of the

Broadwater Project. In addition, Broadwater is committed to compensating displaced fishermen that demonstrate a loss of commercial fishing grounds as a result of the Broadwater Project. As such, the limited, adverse economic impacts to the commercial finfishing industry can be readily offset by Broadwater.

As illustrated on Figure 40, the trawling lane that parallels the New York and Connecticut border may be impacted by the Project. The impact to the trawling lane would occur from the FSRU itself as well as the recommended U.S. Coast Guard safety and security zones. However, as illustrated on Figure 40, the established trawling lane is wide enough to accommodate trawling to the north. The following section provides an evaluation and estimate of the value of commercial finfishery landings that would potentially not be accessible over the FSRU's estimated 30 year lifetime. The complete economic impact study evaluating impact to commercial fisheries, recreation and tourism, and vessel traffic is attached as Appendix F.

The future annual value of commercial finfish landings for the period from 2010-2040 are defined as the direct economic impact. The impact estimates are presented for an average year, and for a long-term time horizon spanning the life of the Project. The method used to estimate the value of commercial finfisheries landings was based on using an extract of the commercial species landings data within the east end and west end Long Island Sound data provided in the Fisherman's Outreach report (*see* Appendix H). Broadwater estimated the value of landings potentially affected by the recommended Coast Guard 1,210 yard safety and security zone surrounding the FSRU by scaling the available landings data to the acreage affected by the safety and security zone. (*see* Figures 39 and 40.1). (*see* Figure 39). The annual value of landings corresponding to these species within the circular area was projected forward in time over the 30 year life of the Broadwater Project to arrive at an estimate of long-term impacts. No assumptions were made concerning species population growth or catch effort over this time period. The direct economic impacts or value of commercial fish landings represent order of magnitude estimates using available information.



**Table 37 Species, Total Live Pounds, and Estimated Value of Fish Harvested in Long Island Sound Commercial Fisheries During the 2002 and 2003 Fishing Seasons as Provided by NOAA and Estimated Values**

No.	Species	Long Island Sound East to West End Ocean Area <sup>a</sup>		Proposed Safety and Security Zone Ocean Area Surrounding Project FSRU	
		Pounds	Value	Landings in Pounds	Estimated Value of Landings
				1,210 yds	1,210 yds
1	Angler	43,680	\$34,462	838.91	\$661.87
2	Scup	40,733	\$29,200	782.31	\$560.81
3	Bluefish	14,827	\$5,130	284.76	\$98.53
4	Flounder, Summer	12,513	\$24,744	240.32	\$475.22
5	Tautog	3,642	\$6,117	69.95	\$117.48
6	Butterfish	3,527	\$2,138	67.74	\$41.07
7	Squid (Loligo)	1,810	\$1,358	34.76	\$26.08
8	Skates	1,767	\$251	33.94	\$4.82
9	Sea Robbins	1,222	\$202	23.47	\$3.89
10	Sea Bass, Black	1,093	\$2,609	20.99	\$50.11
11	Flounder, Yellowtail	770	\$846	14.79	\$16.25
12	Flounder, Winter	572	\$648	10.99	\$12.44
13	Bass, Striped	272	\$681	5.22	\$13.08
14	Dogfish, Smooth	189	\$58	3.63	\$1.12
15	Hake, Red	92	\$37	1.77	\$0.70
16	Croaker, Atlantic	26	\$13	1.05	\$0.25
17	Eel, Conger	25	\$14	0.48	\$0.27
18	Bonito	12	\$18	0.23	\$0.35
19	Flounder, Sand-Dab	4	na	0.08	na
	<b>Total:</b>	<b>126,776</b>	<b>\$108,527</b>	<b>2,434.83</b>	<b>\$2,084.34</b>

Table 37 shows the results of the scaling calculations using the relative number of trawl area acres to estimate the value of fish landings. The table shows that applying this method, the recommended FSRU safety and security zone areas would correspond to several thousand dollars worth of fish landings within an average year.

The estimated commercial landings in pounds were held constant over the projection period but the annual unit value (\$/lb), used to calculate the annual value of landings was increased over time based on the historic trend growth rate for all combined species. The long-term or cumulative direct impact over the 30 year life of the Broadwater Project is estimated at approximately \$36,000 in present value terms.

The economic impacts associated with the potential loss of commercial fisheries were estimated for an average year, and also over the long-term 30 year operational life of the Project. The long-term impacts were estimated for each year over the life of the Broadwater Project and also expressed as a cumulative present value sum. The cumulative present value sum is a measure of the total long-term impact in present worth terms.

Table 38 summarizes the estimated direct, indirect, and induced economic impacts. Anticipated conflicts with commercial fisheries are projected to be relatively small or negligible. There would be virtually no impact on employment levels for the commercial fishing industry attributable to the loss of access to the waters by virtue of the recommended safety and security zone.

**Table 38 Summary of Economic Impacts to NYS Commercial Fisheries Average Year and Long-Term Cumulative Impacts**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
	Proposed U.S. Coast Guard Safety and Security Zone	
	1,210 yds	1,210 yds
<b>Total Industry Output</b>		
Direct	\$2,211	\$35,809
Indirect	\$855	\$13,853
Induced	\$1,348	\$21,828
Total	\$4,415	\$71,489
<b>Employee Compensation</b>		
Direct	\$512	\$8,290
Indirect	\$296	\$4,789
Induced	\$428	\$6,930
Total	\$1,236	\$20,009
<b>Total Value Added</b>		
Direct	\$1,376	\$22,283
Indirect	\$494	\$7,994
Induced	\$868	\$14,057
Total	\$2,738	\$44,334

### *Navigable Waters and Vessel Traffic*

The Broadwater Project is also consistent with the objectives of Policy 9 as it substantially assures continued public access to public use of the Sound's navigable waters, including commercial vessel traffic. Long Island Sound supports significant commercial/industrial vessel transits as the primary thoroughfare accessing the established industrial ports on the Long Island Sound coastline. These navigation-dependent activities have historically been and continue to be very important to the economies of New York and Connecticut. Significantly, navigation-dependent activities remain a very active part of how the main body and port areas of Long Island Sound are used today. Broadwater purposely sited the FSRU and interconnecting pipeline in their proposed locations to avoid and minimize water-use conflicts with existing shipping and use of navigable waterways.

The main shipping route in Long Island Sound runs generally down the center of the Sound on a straight course from deepwater areas in the eastern Sound to the deepwater pass through Stratford Shoal. A second primary shipping route exists on a northeast to southwest alignment toward the Northport Harbor area in New York. From both of the two primary east-west shipping routes, traffic branches to enter the existing deepwater ports throughout the Sound.

The FSRU was sited between the two primary east-west shipping routes to minimize impacts on commercial/industrial vessel transits.

There is a potential for conflict between the historic shipping route that traverses the central portion of the Sound as a result of the recommended U.S. Coast Guard safety and security zone around the FSRU. A 1,210 yard safety and security zone for the FSRU measured from the mooring tower as the center point would result in potential impacts to existing shipping routes based on the U.S. Coast Guard-provided transit data. Given the breadth of the shipping route as reflected on the U.S. Coast Guard data, however, this potential conflict is very manageable and will have little impact on vessels accessing these transit routes. This is because large commercial vessels transiting the Sound are piloted by local pilots who are well aware of existing limitations and would certainly be so with respect to any such constraints associated with the FSRU. Therefore, once the recommended U.S. Coast Guard safety and security zones go into effect, vessel pilots can modify their course of transit accordingly. And as a result of the Broadwater LNG terminal's location in the widest portion of the Sound, there are unlikely to be significant vessel use conflicts as there remains ample space to allow for navigation outside the recommended 1,210 yard U.S. Coast Guard safety and security zone. The greatest potential for marine conflict would arise from the ingress and egress of LNG carriers transiting to and from the FSRU. Such conflicts are most likely to arise in the Race, which constricts traffic flow between the Atlantic Ocean and Long Island Sound. The Race is heavily traveled and occasionally requires passing vessels to merge into a two nautical mile corridor over three nautical miles. Vessels using the Race include a broad mix of naval vessels with a surrounding security zone, commercial deep draft vessels, commercial fishing vessels, and recreational fishing and pleasure crafts. Vessels that are not deep draft will be able to pass through the Race simultaneously with LNG carriers because shallower draft vessels can travel closer to shore. The Race does not currently have a Traffic Separation Schedule (TSS). Based on a review of existing NOAA charts, the transiting LNG carrier would not result in situations that would prevent commercial or non-commercial traffic from transiting the Race. In addition, the Captain of the Port of Long Island Sound, U.S. Coast Guard Captain Peter Boynton, has confirmed that directing both submarine and LNG carrier traffic in Long Island Sound is manageable.<sup>9</sup> The WSR supports this position by further stating that the impacts of the moving safety and security zones around LNG carriers on other waterway users of the Sound are manageable. WSR §§ 8.2, 8.3. The issue is one of simple traffic management based on vessel traffic through the Race, which will remain open and passable with only temporary access limitation as LNG carriers pass through.

Consistent with common maritime practice, commercial vessels will have pilots on board to allow for close coordination of incoming and outgoing commercial vessels through the Race. Continued coordination between the pilots will assure that conflicts are appropriately managed. For example, it is unlikely that an LNG carrier and a commercial vessel can simultaneously pass the Race due to the narrow passage and likely exclusion zone requirements. Therefore, if an LNG carrier and commercial vessel arrive at the Race at the same time, ultimately one of the vessels will need to wait until the other has passed. Broadwater estimates that it would take approximately 15 minutes for an LNG carrier to pass through the Race,

<sup>9</sup> See "CG Captain Sees Subs, Tankers Co-existing; Security zones for LNG vessels in L.I. Sound viewed as routine," Paul Choiniere, *The Day*, 3/16/06.



resulting in no significant delay for other commercial vessels. Broadwater anticipates that only two to three carriers per week would call on the FSRU, minimizing potential conflict at the Race. WSR § 8.2.

The LNG carriers could encounter ferry traffic on their ingress and egress to the FSRU. Broadwater will be able to minimize potential conflicts by considering the schedules of the ferries when scheduling the LNG carriers. Close coordination with the ferry captains will function to minimize potential conflict.

Approximately 46 million tons of petroleum and coal products are moved by barge or other vessels to reach Long Island Sound coastal zone markets each year. The Broadwater Project's annual energy importation would be equivalent to 7 million tonnes (metric) per year of LNG. This comparison shows that the Broadwater Project's energy imports would not create a significant increase in the commercial traffic on the Sound.

Last, no significant, permanent impacts on or conflicts with commercial shipping from installation or operation of the subsea pipeline are expected. Installation of the pipeline will be completed in an approximately 6-month time frame between October and April, when there is reduced vessel traffic within Long Island Sound.

#### ***Potential Vessel Use Conflicts Will Not Create Adverse Economic Impacts***

The location of the FSRU and safety and security zone footprint will not result in an economic impact. With respect to economic impacts on commercial vessels, some transiting vessels may need to navigate around this FSRU location, however there is sufficient room or bandwidth within the established shipping lanes to easily accommodate these changes without imposing additional operational costs to commercial vessel operators. Historically, commercial vessels and navigators have become familiar with noteworthy parts of Long Island Sound such as shoals and the Race narrows and have historically adjusted and adapted their behavior without incurring any disruptions to economic activity.

Furthermore, as the Long Island Sound Waterborne Transportation Plan indicates, most water-borne freight, consisting of heavy bulk commodities, is not time sensitive or tied to just-in-time inventory schedules as the freight mostly serves service sectors of the regional economy and not manufacturing. This fact suggests that the possibility of minor delays to shipping traffic resulting from FSRU operations, if any, would not have a negative economic impact on or conflict with these sectors.

It is reasonable to expect that once Broadwater's LNG terminal operations commence, navigators would become familiar with the Broadwater Project footprint and adjust their behavior to work with and around this site location. The East to West and West to East commercial freight traffic has adapted to North – South/South-North ferry transits without any interruptions to economic activity. Similarly, the LNG vessel transits to and from the FSRU would be incorporated into existing commercial vessel flow patterns without incurring any impacts to economic activity.

Broadwater's boat survey confirms that large commercial vessels were primarily observed traveling east-west using established shipping lanes to the north and south of the

FSRU; consequently, such vessels would not be impacted by the proposed siting location of the FSRU and are unlikely to sustain economic impacts.

### ***Recreation***

The Broadwater Project is consistent with the LIS CMP objective of protecting and maintaining existing public access and water-related recreation, which, along with tourism, is an important part of both Suffolk County and the Long Island Sound economies. The major recreational uses of the Long Island Sound include such activities as swimming, beach going, recreational/sport fishing, and recreational boating. To determine potential conflicts with recreational users of the Sound and overall consistency with this policy, Broadwater gathered information and data on these recreational activities to determine the frequency of occurrence and annual economic benefits to the Long Island Sound community, in addition to identifying and analyzing potential impacts to such water-related recreational activities resulting from the Broadwater Project.

For the purposes of quantifying recreational spending in the Long Island Sound coastal area, the activities were divided into three categories due to data availability and distinction between activities: beach swimming, recreational/sport fishing, and recreational boating. The results of Broadwater's economic impact study for categories of activities are varied based upon the proximal relationship between where the activity is most likely to occur relative to the FSRU location. For instance, access to coastal land and waters for swimming and beach visitation can not be expected to be impacted or be conflicted with as a result of the Broadwater Project due to the inherent distance from the proposed FSRU location. Alternatively, boating and fishing activities that could take place closer to the FSRU and the surrounding safety and security zone during Broadwater Project operations could be negatively impacted. These recreational activities and estimated conflicts are discussed individually below.

*Beach Swimming.* Beach visitation and swimming are activities confined, by definition, to coastal areas with beaches. Beach visitation and beach swimming result in a variety of economic impacts to the local community through retail purchases, food and beverage purchases, accommodations, and miscellaneous trip expenses (i.e., gas, tolls, etc.). In 1998, the total economic impact of beach swimming in Connecticut and New York was \$622.2 million and \$514.61 million respectively. This equates to a \$1,136.81 million impact total for the Long Island Sound area in 2005 dollars.

The closest coastline to the proposed location of the Broadwater Project is 9 miles away and does not inhibit or alter the ability of residents or tourists from participating in beach-going activities or swimming. As a result, it is estimated that the Broadwater Project will have no impact on this recreational activity or its associated economic impact to the Long Island Sound area. Observations from other coastal communities around the U.S. show that beach attendance has not been affected in any material way by compatible industrial and commercial marine activities. For instance, beach users in South Florida are accustomed to seeing large cargo and freight vessels transit the coastline within their activity view sheds. These economic activities have not detracted from the recreational experience or beach attendance as revealed in the hotel occupancy data figures.

The location of the FSRU, which will be a minimum of 9 miles from the coastline, is unlikely to diminish beachgoers' ability to enjoy swimming and recreating in the Sound. The general sense of place that is appreciated by Long Island residents and that attracts visitors to eastern Long Island, including beachgoers, will not differ appreciably from existing features in the Sound. As discussed above, a beachgoer's sense of and values associated with the Sound is affected by the diverse range of uses and activities within the Sound, as well as other factors and features that may be visible, audible, or present in a particular portion of the Sound on a given day at a particular point in time. An individual's sense of and values associated with the Sound is dependent upon the importance or weight that person ascribes to certain factors that contribute to the overall "sense" and value of the Sound. It is evident, however, that beachgoers are able to continue to enjoy the Sound in the presence of mixed, diverse uses that exist in the Sound's waters. For example, in Riverhead, the Pier Avenue Beach is less than 2 miles from the offshore ConocoPhillips Northville petroleum terminal. The Pier Avenue Beach is heavily used and widely enjoyed by beachgoers, as demonstrated by the picnic partitions, parking, and other public facilities that have been maintained and improved for use by the public. This pattern of use confirms that users of the Pier Avenue Beach do not find the proximity to the Northville petroleum terminal to affect their sense of and values associated with the Sound and certainly not to a point that they no longer desire to go to there.

Similarly, Wading River municipal beach is adjacent to the Shoreham Energy Center (former Shoreham Nuclear facility). Like the Pier Avenue Beach, the proximity of the Shoreham Energy Center to the Wading River Beach does not appear to diminish users' ability to enjoy the coastal resources within the Sound. Adults and children enjoy this beach, including the playground and picnic areas. And as with the Pier Avenue Beach, the Wading River Beach has been maintained and improved to accommodate the public's ability to use and enjoy this beach that is located close to a former nuclear facility. Here, the Broadwater Project will be a minimum of 9 miles from the nearest coastal point, and in many instances, it will be substantially farther away than either the Pier Avenue Beach or the Wading River Beach are from industrial sites and/or facilities. Based on the historic and continued use of these beach areas in the Long Island Sound coastal region, which continue to sustain a high degree of use and enjoyment by the public even though they are proximally located to industrial sites and facilities, that the Broadwater Project is not likely to negatively impact beachgoers' and other users' "sense" of and values associated with the Sound. (*See also* Broadwater's response to LIS CMP Policies 1 and 3, above.

The Broadwater Project is also consistent with this Policy because it protects existing visual access to coastal lands and waters. As a result of its location in the central portion of the Sound 9 miles from the coast, the Broadwater Project avoids physical blockage of visual access within the Sound, and "minimizes adverse impact on visual access." While there may be some perceived adverse impact based on the ability to see the FSRU in the Sound when in the near-shore waters or on a beach (depending on location and weather conditions, which both affect visibility), the FSRU will be consistent with other features on the Sound. Thus, it is not anticipated to diminish the average user's enjoyment of the Sound. With the FSRU more than 9 miles offshore from the nearest coastal location -- and in many instances more than double that distance -- there will be a vast expanse of open Long Island Sound water between the viewer and the FSRU. Additionally, the LNG terminal's placement, design, and coloration all serve to minimize adverse visual impacts from the Broadwater Project, including the FSRU. Importantly,

because of its distant, offshore location, the FSRU will avoid loss of onshore visual access to the Long Island Sound since there will be no new construction of onshore facilities that will result in physical blockage of existing visual access to the Sound. The FSRU will also be consistent with other large vessels and freight carriers within Long Island Sound, and thus is not anticipated to have a significant impact on recreational users' ability to enjoy the Sound. The potential effects on visual access to the Long Island Sound are discussed in Broadwater's Visual Resources Assessment, which is attached as Appendix K. Because the Broadwater Project will not adversely affect the availability of public access to view Long Island Sound from the shoreline, and because the FSRU and LNG carriers will be consistent with the existing vessel traffic in the Sound, the Broadwater Project is not anticipated to adversely affect visual access to Long Island Sound. Correspondingly, a negative economic impact on beach swimming and/or related recreational activities as a result of the Broadwater Project is not anticipated.

*Recreational Boating.* Long Island Sound is a popular recreational boating area. During construction of the proposed pipeline facilities, there will be temporary and minor loss of recreational boating area in the immediate vicinity of the active work area. Because installation will occur primarily during the fall, winter and spring months, when use of the Sound by recreational boaters is reduced, impacts on recreational boating are minimized. In addition, according to the WSR, the highest density of recreational boating is generally within 2.3 to 3.5 miles off the shore of both coasts of Long Island Sound. WSR § 3.1.2.3. Therefore, installation of the facilities is expected to have only minor, if any, impacts on recreational boating. During operation, the proposed pipeline will have no effect on recreational boating due to its installation beneath the seafloor.

As discussed above, recreational boating on Long Island Sound is a significant economic driver and results in several billion dollars in total economic impact annually. The Boat Traffic Survey completed in connection with Resource Report No. 8, Land Use, Recreation and Aesthetics, outlines the approximate boating activity in the vicinity of the Project site during several of the busiest boating days of the year. A copy of the Boat Traffic Survey is annexed as Appendix I and is consistent with the findings of the Coast Guard in the WSR.

Broadwater has analyzed the potential economic impact on recreational boating with the Broadwater Project using the data compiled in the Boat Traffic Survey. Taking the number of boats surveyed in the vicinity of the FSRU, along with the estimated boating season, and expenditure per boat, the total economic impact of the FSRU on recreational boating can be estimated. Based on these calculations, Broadwater estimates a total direct economic impact of \$6,156,640. When measured against a total expenditure for Long Island Sound (inflated to 2005 dollars of \$102,297,238), the potential loss in expenditures equals 6%. However, this presumes that all boats on a course that would take them in the vicinity of the proposed FSRU would opt to stay off the water altogether and would expend absolutely no money on boating activities in the Long Island coastal region, rather than to divert their course. The far more likely scenario, however, is that such boats would choose to avoid the area of the proposed FSRU through prior trip planning or small course adjustments and the more likely overall economic impact, if any, would be minimal or none at all.

There are approximately 844,800 total acres in Long Island Sound (Long Island Sound Study 2006). Assuming 20% of this total area is unavailable because it is not suitable for recreational boating due to the proximity to shore, depth of water, or other obstructions, 675,840

acres of adequate boating water still remains. The percent total of the recommended U.S. Coast Guard safety and security zone compared with the total adequate and available boating area of Long Island Sound is presented in Table 39 below. This table confirms that the ocean area affected by the safety and security zone that would potentially be off limits to recreational and commercial boating represent a minute portion (less than 1%) of the total usable navigable water in Long Island Sound. Therefore, the Broadwater Project is consistent with the goals and objectives of this policy because it is not anticipated to impact the availability of appropriate and adequate physical public access and recreation throughout the coastal area.

**Table 39 Percentage of Navigable Water in Long Island Sound**

Proposed Security Zone	Acres in Zone	% of Total Long Island Sound
1,210 yard buffer	949.7	.11%

Besides sailing regattas, recreational boaters typically do not follow a specific course and would be able to alter their heading to avoid the FSRU and any security buffer established, without significantly or adversely impacting their trip. With respect to regattas where the course would potentially pass in the vicinity of the FSRU security zone, Broadwater's Boat Traffic Study establishes that there is ample room for the regattas to make minor adjustments to courses, if necessary, to avoid the proposed FSRU location. This would not be considered a significant issue and the Broadwater Project would not prevent any regattas in Long Island Sound.

*Recreational Sport Fishing.* As discussed above, the proposed FSRU as part of the Broadwater Project and the associated safety and security zone would only occupy a small portion of the Long Island Sound. The Broadwater Project is unlikely to cause undue restrictions on recreational sport fishing. Table 39 shows a break down in acres of the Long Island Sound waters that would no longer be accessible to anglers for sport fishing with the Broadwater Project. According to the 2001 NY Sea Grant, participation rates for recreational sport fishing have been decreasing since 1994. With this decrease in the overall number of anglers, the conclusion could be drawn that there has been an overall decrease in competition for fishing areas in Long Island Sound. Thus, sport anglers would likely be able to find adequate fishing locations in Long Island Sound outside of the recommended safety and security zone associated with the FSRU.

The Stratford Shoal area, which is a popular fishing location and has high fisherman boat traffic as noted in the Boat Traffic Survey, is an estimated 12 miles away from the proposed FSRU location. There would be no conflict between the FSRU and sport fishing in the Stratford Shoal area and the Project.

As a result of these analyses, Broadwater has confirmed that the Broadwater Project is consistent with this policy as it will substantially preserve existing physical access and recreation throughout the coastal area.



**POLICY 10:** Protect Long Island Sound's water-dependent uses and promote siting of new water-dependent uses in suitable locations.

- 10.1 *Protect existing water-dependent uses.*
- 10.2 *Promote maritime centers as the most suitable locations for water-dependent uses.*
- 10.3 *Allow for development of new water-dependent uses outside of maritime centers.*
- 10.4 *Improve the economic viability of water-dependent uses by allowing for non-water-dependent accessory and multiple uses, particularly water-enhanced and maritime support services.*
- 10.5 *Minimize adverse impacts of new and expanding water-dependent uses, provide for their safe operation, and maintain regionally important uses.*
- 10.6 *Provide sufficient infrastructure for water-dependent uses.*
- 10.7 *Promote efficient harbor operation.*

Broadwater is consistent with and furthers the objectives of this policy, since it proposes the siting of a new, much-needed water-dependent energy business activity in a suitable location within Long Island Sound. Indeed, LIS CMP Policy 13.4 specifically contemplates LNG facility within the Sound. Likewise, New York State's CMP recognizes the importance that the state's coastal resources play in satisfying the state's energy needs. The federally-approved FEIS for New York State's CMP states that New York's coast "provides sites for numerous energy facilities, including ... gas transmission lines; oil and gas exploration, development, transfer and storage facilities (including LNG facilities) .... (emphasis supplied). NYS CMP FEIS, II-5-37. New York's recognition that certain energy facilities are water-dependent is consistent with the federal CZMA's recognition that energy facilities -- including LNG facilities such as the Broadwater Project -- are coastal dependent and must be given priority consideration in coastal management decisions. *See* CZMA § 303(2)(d); *see also* 71 Fed. Reg. 788 ("The CZMA requires States to consider the national interest as stated in the CZMA objectives and give priority consideration to *coastal dependant* uses and processes for facilities related to ... energy... when adopting and amending their [CMPs] and when making coastal management decisions.") (emphasis supplied).<sup>10</sup>

### ***The Broadwater Project is a Much-Needed Water Dependent Use***

The business that is the Broadwater Project -- serving the target markets with overseas-sourced energy -- can only be conducted in/on and adjacent to Long Island Sound because the business requires direct access to the Sound. Additionally, the use of Long Island Sound is an integral part of the business of the Broadwater Project. As such, the Broadwater Project is a water-dependent use and a coastal dependent use.

<sup>10</sup> To the extent there is a definitional difference perceived between a "coastal dependent use" and a "water dependent use," the "coastal dependent use" definition controls the outcome. *See* CZMA Federal Consistency Regulations, 71 Fed. Reg. 788, 789 (Jan. 5, 2006, to be codified at 15 CFR Part 930). But because the Broadwater Project satisfies both definitions, any perceived or real differences in the two terms is inconsequential here.



The LIS CMP provides the following definition: "Water-dependent use means a business or other activity which can only be conducted in, on, over or adjacent to a water body because such activity requires direct access to that water body, and which involves, as an integral part of such activity, the use of the water." LIS CMP Definitions, Ch. 4; *see also* N.Y.C.R.R. tit. 19 § 600.2(ag).

The water-dependency of the business here -- the Broadwater Project -- is manifest. The Broadwater business is the receipt of LNG from overseas locations and the transportation of the resulting natural gas to the target markets of Long Island, New York City, the New York City metropolitan region, and Southern Connecticut (collectively, target markets). This business is, without question, water-dependent under the LIS CMP (as well as a coastal-dependent energy facility under the CZMA). First, overseas-sourced LNG must be shipped from international waters, through the Atlantic Ocean, and into Long Island Sound. In order to obtain the quantity of LNG that the Broadwater Project requires to satisfy the needs and demands of the target markets for economical natural gas, waterborne transportation is the only feasible method of delivery. It is not possible to transport the needed LNG via air or road transport. In addition, the transfer of LNG from LNG carriers to the FSRU is similarly water-dependent as a result of the water-dependency of both the LNG carriers and the FSRU. And even if the regasification of the LNG could be reasonably completed onshore in the Long Island Sound area, (technical limitations associated with transporting LNG by pipeline from an offshore receiving terminal to an onshore regasification facility are more fully set forth in Section 2.2.7.5), the transfer from the LNG carriers to any onshore regasification facilities would also be water-dependent because such transfers would only be able to be completed in or adjacent to the Sound's waters. Such an alternative would also result in increased impacts on shore and to near shore coastal waters. For example, an onshore regasification facility would require pipeline and jetty construction and, resultingly, increased dredging, and visual impacts. Furthermore, such an alternative would still result in the FSRU being within the coastal zone and would not serve to avoid issues pertaining to the safety of Long Island's residents. Such an onshore alternative also would cause competition for and impacts to Long Island's valuable coastline.

The operations of the FSRU are similarly water-dependent because, in addition to receiving LNG from water-borne carriers, it will distribute vaporized LNG into the interconnection pipeline for delivery into the IGTS subsea pipeline. Broadwater's business of delivering vaporized LNG to the target markets, which relies upon the existing IGTS pipeline, further proves the Broadwater Project's unique needs rendering it a water-dependent use. The onshore facilities that will be used for the marine transfer of FSRU support vessels and people are water-dependent as well, thereby necessitating a location on or adjacent to the waterfront. But to avoid impacts and as further evidence of the Project's consistency with coastal policies, Broadwater will use existing, appropriate locations along the waterfront rather than constructing new facilities so as to reduce the competition for limited space on Long Island's coastline. And any onshore support facilities in Port Jefferson<sup>11</sup> will be consistent with the water-dependent

<sup>11</sup> Broadwater's water-dependent, onshore facilities may also be sited in a suitable, existing commercial location in the Village of Greenport, which, while not a designated maritime center, would be an appropriate site based on existing land use and zoning for the potential site and surrounding area. A strong reflection of the suitability of the Broadwater Project in Greenport is the support for the Project by the Mayor of Greenport.

commercial and industrial facilities that are characteristic of Long Island Sound's maritime centers.

In addition to these technical factors that confirm the Broadwater Project's water-dependency, several other considerations relating to project need, environmental impacts, and construction and operation costs of various site alternatives confirm the Project's suitability within Long Island Sound. First, energy demand in the U.S. is projected to increase at a rate that is fast outpacing supply. Natural gas demand within New York, in particular, is expected to grow well beyond its current levels over the next 15 years (*see* Resource Report No. 1, General Project Description). The growth rate for natural gas is estimated to be approximately 3.2% annually in the Broadwater Project's target markets. This growing demand is occurring at a time when domestic and North American production of natural gas has been generally flat, and projected increases in production will not keep pace with demand. It is also occurring at a time when major interstate and intrastate pipeline systems in the northeast are near or at capacity. As a result, LNG imports are becoming an increasingly critical part of the U.S. energy supply market and are projected to help offset the imbalance between domestic supply and consumer demand. Another important factor confirming the Broadwater Project's suitability and compatibility within the Sound is that the LIS CMP expressly identifies LNG facilities within the text of Policy 13. (*see* LIS CMP Policy 13.4). It is significant that the drafters of the LIS CMP singles out LNG facilities while there is little or no mention of other types of energy facilities. This specific discussion of LNG facilities confirms that the drafters contemplated and considered LNG facilities to be generically suitable uses within Long Island Sound. And while suitability of a proposed LNG facility is subject to a showing of consistency with the 13 Sound specific policies of the LIS CMP and other applicable and enforceable programs, Broadwater's submission provides overwhelming evidence that substantiates its determination that the Broadwater Project is consistent with the applicable policies of New York's CMP, including but not limited to the LIS CMP.

#### ***Broadwater's Offshore Location Outside a Maritime Center is Appropriate***

Maritime centers are those areas recognized as special coastal areas that are developed with and particularly well-suited for water-dependent commercial and industrial uses or essential support facilities. Port Jefferson Harbor is among the coastal communities that have been identified as a Long Island Sound maritime center. Maritime centers are "the most suitable and appropriate locations on the Sound coast for expansion of existing, or the development of new, water-dependent commercial and industrial uses." LIS CMP at 98. While LIS CMP Policy 10 states that maritime centers are to be promoted as the most suitable locations for water-dependent uses, the policy also recognizes that, in certain instances, siting a water-dependent use outside the maritime center is acceptable and must be allowed. In addition, it is unclear whether the LIS CMP's promotion of such uses in Maritime Centers was in comparison to other onshore (as opposed to offshore) locations.

Aspects of the Broadwater Project will be located outside of a maritime center. This location is nonetheless consistent with LIS CMP Policy 10. There are numerous reasons why the Broadwater Project is an example of a project where siting outside a maritime center is appropriate, necessary, and consistent with the LIS CMP. The explanation provided in LIS CMP subpolicy 10.3 states "[n]ew water-dependent uses may be appropriate outside maritime centers if the use: (1) should not be located in a maritime center due to the lack of suitable sites; or (2)

has unique locational requirements that necessitate its location outside maritime centers; or (3) would adversely impact the functioning and character of the maritime center if located within the maritime center; or (4) is of a small scale and has a principal purpose of providing access to coastal waters.” The satisfaction of any one of these factors is sufficient to support locating a water-dependent use outside a maritime center. Here, the Broadwater Project satisfies three (1-3) of the four prongs and therefore falls within the exceptions to siting within a maritime center.

The FSRU is properly sited outside of a maritime center because such location is the most preferable location and onshore alternatives are not feasible.<sup>12</sup> That is, an onshore location for the FSRU on Long Island is so imprudent and antithetical to generally accepted engineering and planning principles that it must be rejected. As such, the offshore location for the Broadwater Project meets the LIS CMP Policy 10 standard for siting outside a maritime center. From a technical standpoint, an onshore location for Broadwater’s storage and regasification facilities would create significant engineering and logistical barriers. As is discussed in Section 2.2 above, the feasibility of such onshore facilities would be largely dependent upon their proximity to the coast due to distance considerations for LNG transfer piping (e.g., temperature and pressure maintenance, and steel piping thermal expansion). In addition, siting the proposed Broadwater Project in a maritime center would result in significantly greater environmental impacts to Long Island Sound’s on- and near- shore natural resources, due to the need for additional infrastructure to accommodate LNG carriers or to support onshore storage and regasification operations. Examples of potential impacts that could result from an onshore, maritime center alternative include those associated with the construction of a jetty (e.g., extensive near-shore dredging) for access to a moored LNG receiving terminal or to provide access between the LNG carrier and any onshore regasification unit or onshore storage tanks.

Another consideration that strongly weighs in favor of Broadwater’s proposed offshore FSRU location is the population density of Long Island Sound’s coastal communities. In 2004, the estimated population of Suffolk County was 1,475,488. Even assuming that there was a technically feasible, onshore site within a distance over which it would be feasible to pipe LNG, the dense population of Long Island Sound’s coastal communities effectively eliminates an onshore, coastal siting location based on safety and security issues. The selected Broadwater Project location would have the lowest population living within 1 mile and 10 miles of the LNG terminal as compared to the other existing on shore LNG terminals in the United States. As such, the proposed, offshore location is by far the most conservative when considering potential safety and security issues for Long Island’s residents and tourists and consistency with applicable coastal zone policies. This is consistent with the Coast Guard’s findings in the WSR that the proposed location of the FSRU has a number of significant safety and security benefits when compared to those in other locations or using other technologies, especially with respect to the threat and consequences since it located far away from population centers. WSR §§ 5.2.2, 8.2. Also important to consider is that an onshore, maritime center location for an LNG terminal would necessitate the imposition of on-land vapor cloud and radiation exclusion zones that would result in logistical considerations for the functioning of the maritime center.

<sup>12</sup> Feasible includes the concepts of capable of being done, prudence, and meeting generally accepted engineering and planning practices.

All of these factors establish the preferability of the offshore LNG terminal in its proposed location over any potential onshore site. As such, the proposed offshore, non-maritime center location is appropriate and consistent with this policy.

***The Broadwater Project Minimizes Adverse Impacts***

The Broadwater Project is consistent with this policy because its design and location will also minimize adverse impacts and result in the least impact to the Long Island Sound coastal region compared to impacts that would result from alternatives. Among other salutary aspects, the Broadwater Project will be protective of natural resources as a result of its offshore transshipment of LNG. The LNG terminal also will be located to avoid navigational channels and to minimize disruption of seasonal fisheries activities.

***The Broadwater Project will Utilize Existing Coastal and Pipeline Infrastructure***

As a result of the distant, offshore location for the FSRU and the use of existing sites for its water-dependent, onshore support facilities, the Broadwater Project can utilize existing infrastructure. Onshore buildings in water front locations will provide adequate onshore infrastructure. Similarly, the existing IGTS pipeline is another example of in-place infrastructure that will be a key part of Broadwater's business. The Broadwater Project's reliance on waterborne transport for cargo and people to the FSRU -- as well as for the delivery of LNG -- is consistent with this policy. As a water-dependent use that meets a manifest energy need, the Broadwater Project is consistent with the objectives of Policy 10. For all of these reasons, Broadwater's proposed alternative advances and is consistent with this policy.

**POLICY 11:** Promote sustainable use of living marine resources in Long Island Sound.

- 11.1 Ensure the long-term maintenance and health of living marine resources.*
- 11.2 Provide for commercial and recreational use of the Sound's finfish, shellfish, crustaceans, and marine plants.*
- 11.3 Maintain and strengthen a stable commercial fishing fleet in Long Island Sound.*
- 11.4 Promote recreational use of marine resources.*
- 11.5 Promote managed harvest of shellfish originating from uncertified waters.*
- 11.6 Promote aquaculture.*

Broadwater is consistent with and furthers the objectives of this policy, because the FSRU location 9 miles off the Long Island coast will limit impairment and be respectful of the living marine resources of Long Island Sound, thereby promoting their sustainability. The Broadwater Project is consistent with the goals and objectives of this policy, since the Project will maintain the commercial and recreating public's ability to use the Sound's living marine resources, including finfish, shellfish, crustaceans, and marine plants. As is more fully detailed below, the Broadwater Project is consistent with the objectives of this policy.

***The Broadwater Project Is Respectful of Marine Resources, Including Shellfish, Finfish, Crustaceans and Marine Plants***

Broadwater's distant, offshore location in the central portion of the Sound avoids inshore areas that are critical to the Sound's shellfishing industry. To protect the most sensitive nearshore resources in the Sound, the Project has been designed to avoid shore crossings so that coastal and nearshore habitats and shellfish beds will not be affected. These inshore areas are also critical to the Sound's finfishery, providing spawning and nursery habitat. As part of its coastal zone consistency evaluation and suitability assessment for siting the LNG terminal in its preferred location, Broadwater completed a review of the Poletti ichthyoplankton (IP) program data and additional IP sampling to verify the Poletti data findings. The data confirms that higher IP concentrations are located in the shallower depths of the Sound, consistent with the value of these inshore areas as spawning and nursery habitat for finfishery and providing beds for shellfish and crustaceans as well. While some loss of commercial fishing may be unavoidable from implementation of the Project, Broadwater is committed to compensating fishermen for demonstrated loss of income as a result of the Project. Through consultations with local fishing groups and regulatory agencies, Broadwater has identified several mitigation measures to address potential impacts on Long Island Sound's living marine resources and related economics, such as the commercial fishing industry. In addressing these considerations, the positive environmental, (e.g., natural gas fuel) economic, and energy benefits from the Project to the area are harmonized with the interests of the commercial fishing industry.

***The Broadwater Project Will Permit Continued Recreational Use of the Sound's Marine Resources***

Recreational fishing is a recognized beneficial use of the Sound. Broadwater has sited the FSRU in the central portion of the Sound, where field surveys have demonstrated that the bottom is largely flat and comprised of a homogenous silty clay substrate. There are no evident bottom features that would indicate a high concentration of recreational fish species. On-water surveys during high-use periods demonstrated that the central portion of the Sound is not highly used by recreational fisherman, who tend to congregate in areas with greater bottom relief and structure that provide higher quality habitat.

The Broadwater Project will be installed to avoid use conflicts with water-dependent and water-enhanced recreation as well as conflicts/impacts on the Sound's living marine resources. FSRU installation and pipeline construction will occur from November through March. This schedule was chosen to minimize adverse impacts on Long Island Sound fisheries and habitat and to ensure that Project activities do not interfere with population and habitat maintenance and restoration efforts.

The Broadwater Project and its associated subsea pipeline are also protective of marine resources as they will not divert, restrict, or alter water circulation and sedimentation patterns and transport. Installation of the FSRU mooring system and pipeline may result in short-term impacts, including re-suspension of marine sediments, process water discharges, and disturbance to marine species and EFH, all of which are contributing factors to the commercial and recreational viability of Long Island Sound. To minimize suspension of bottom sediments, plowing will be used to the extent possible to install the pipeline. Because plowing does not fluidize bottom sediments, sediment suspension is anticipated to be minimal. The pipeline will

be installed so as to not create a barrier that prevents the migration of marine species on the seafloor. This will minimize impacts on the local ecosystem and allow for quicker recovery following installation of the pipeline. Mooring system and pipeline installation activities will have short-term effects to benthos by disturbing benthic invertebrates directly beneath the pipeline and mooring system. The impacts will be highly localized; it is not anticipated that placement of the pipeline will alter the benthic community outside the footprint of the mooring tower and pipeline trench. Construction techniques will be employed so that benthic communities may become reestablished in the shortest time possible. While the use of water will result in some unavoidable impingement and entrainment of planktonic eggs and larvae, the impact from the operation of the FSRU will not be significant. There will be no appreciable impact to the Sound's fishery because the FSRU will be located in the center of the Sound, away from the shallow, highly-productive estuarine shorelines. In addition, intakes will occur at mid-water depths, limiting the species that will be impacted. Impacts to the Sound's fishery will also be limited because the volume of water intake that may result in impingement and entrainment over any given period is insignificant relative to the total volume of the water available in the Sound and given the frequency of flushing/water turnover that occurs due to the proximity of the Sound to the Atlantic Ocean. To minimize impacts on water quality and marine species, water from Long Island Sound will be used for hydrostatic testing. An approved biocide may be added to reduce algal growth, if necessary. Once hydrostatic testing has been completed, the water will be tested and, if required, treated before being discharged into the Sound.

For all these reasons, the Broadwater Project is consistent with the policy.

**POLICY 12:** *Protect agricultural lands in the eastern Suffolk County portion of Long Island Sound's coastal area.*

- 12.1 *Protect existing agriculture and agricultural lands from conversion to other land uses.*
- 12.1 *Establish and maintain favorable conditions which support existing or promote new coastal agricultural production.*
- 12.1 *Minimize adverse impacts on agriculture from unavoidable conversion of agricultural land.*
- 12.1 *Preserve scenic and open space values associated with the Sound's agricultural lands.*

The Broadwater Project will not impact the agricultural lands in the eastern Suffolk County portion of Long Island Sound's coastal area. First, the LNG terminal's siting location 9 miles off the Sound's coastline will not at all impact the Sound's existing onshore agricultural lands. Second, the onshore facilities associated with the Broadwater Project will be located in already existing sites that are commercially/industrially zoned and, thus, will not compete with Suffolk County's agricultural lands or open spaces. As such, this policy will not be applicable to the Broadwater Project.



**POLICY 13:** *Promote appropriate use and development of energy and mineral resources.*

- 13.1 *Conserve energy resources.*
- 13.2 *Promote alternative energy sources that are self-sustaining, including solar and wind powered energy generation.*
- 13.3 *Ensure maximum efficiency and minimum adverse environmental impact when siting major energy generating facilities.*
- 13.4 *Minimize adverse impacts from fuel storage facilities.*
- 13.5 *Minimize adverse impacts associated with mineral extraction.*

The very purpose and design of the Broadwater Project, which will introduce not merely supporting infrastructure but a much needed new economical energy supply into the region, is consistent with and furthers the objectives of this policy. Significantly, it is important to note at the outset that this policy expressly recognizes that LNG facilities -- such as the Broadwater Project -- are among the types of energy facilities that are suitable for and will potentially be sited in Long Island Sound. LIS CMP Policy 13.4, which calls for the minimization of impacts from fuel storage facilities, states that "Liquefied Natural Gas facilities must be safety sited and operated." LIS CMP Policy 13.4. From the plain language of this LIS CMP policy, it is clear that LNG facilities are contemplated as a potentially suitable and appropriate use within Long Island Sound, subject to, among other things, a demonstration of consistency with applicable and enforceable coastal management programs. (See also Broadwater's response to LIS CMP Policy 10, above). Here, Broadwater's business -- the receipt of LNG at the FSRU for vaporization into natural gas and the delivery of the resulting natural gas to the subsea IGTS pipeline and into the target markets -- provides a compelling proposal that will benefit the Region with the introduction of a stable supply of competitively priced natural gas. The Broadwater Project, if approved, will introduce into the Region a new supply of fuel that is cleaner-burning than and competitively priced with other fuels that are presently used to power homes, schools, hospitals, businesses, and industry in the Long Island Sound coastal area. In addition to the resulting direct and indirect economic benefits of the Broadwater Project, this new supply of natural gas will also provide a source of energy that can be used to support repowering of existing power generation facilities. Repowering of existing power generation facilities in the Region would yield substantial environmental benefits, particularly relative to existing air quality in and around the Long Island Sound coastal area -- and beyond. (See Appendix C -- Air Quality). For these reasons, and those that are more fully discussed below, the proposed Broadwater Project is appropriate for Long Island Sound.

It is well documented that the Northeast United States, including Long Island and Connecticut, need access to additional natural gas resources to meet the region's future energy demand and to offset the increase in the price of natural gas associated with unmet demand. The data regarding current energy demands and anticipated growth in the NEEC demonstrates that the target markets' energy supply is and will continue to be profoundly under sourced unless there are new sources of energy introduced to the region. The NEEC region currently accounts for 14 percent of the total gas use in the U.S. and Canada. Within the NEEC markets, the Long Island, New York City, and Southern Connecticut regions consume approximately 20 percent of the total gas consumption at an estimated 700 bcf per year. For example, in 2004, the demand of the NEEC markets was 3.5 trillion cubic feet (tcf) per year. By 2015, well-regarded Energy and

Environmental Analysis, Inc. (EEA) estimates that figure will grow to 4.7 tcf. In the Long Island, New York City, New York City Metropolitan, and Southern Connecticut region, EEA estimates that the average daily demand will grow from 1.8 bcfd in 2005 to 2.6 bcfd in 2025.

The peak daily demand in the Long Island, New York City and New York City metropolitan region and Southern Connecticut region was 3.3 bcfd in 2005 and is expected to be 4.6 bcfd in 2025. Historically, the majority of natural gas consumption has been in the residential and commercial sectors, using 37% and 18% of the available gas supply respectively. Most recently, the power generation sector has become the largest consuming sector in the area, with a 2004 consumption rate of 39% of total gas supply. From 1995-2004, the growth rate for gas consumption within the power sector was 5.6%. Notably, EEA's study reveals that gas consumption in the industrial sector is not a significant factor within the market, accounting for only 6% of the 2004 total supply in the Long Island, New York, and Southern Connecticut markets. In the past two years, prices in the NEEC have averaged in excess of \$6 MMBtu. New York City (and New England) prices are the highest within the region, nearing \$7/MMBtu on average. The introduction of LNG directly into the NEEC markets, and more particularly, the target markets of the Broadwater Project, should reduce the basis premiums that result from transporting LNG from distant regions and the lack of adequate storage capacity once LNG arrives in NEEC markets. Resulting reductions in energy costs will benefit residential consumers as well as businesses, hospitals, and school districts that use natural gas to heat buildings.

Eighty-five percent of NEEC's gas supply is delivered from long haul pipelines from the U.S. Gulf Coast (and western Canada). The Broadwater Project will increase regional reliability and energy security and reduce price volatility by bringing the energy source directly to the region. The reliability of the energy source within the region is a key factor that demonstrates the need for the Broadwater Project. 20,000 MW of new gas-fired capacity have been added in the NEEC region since 1998. And, in the New York City metropolitan region, 90% of power generation facilities use natural gas as a primary or secondary fuel. With the Broadwater Project, there will be increased delivery and receipt of economical fuel sources more directly to their target markets, reducing the likelihood of fluctuating availability during times of significant need (e.g., periods of extremely cold weather). In particular, the proposed Broadwater Project will increase both gas supply and capability to the region, particularly the New York City market. Presently, the New York City contracted pipeline capacity is 3.2 bcfd. With the Broadwater Project, delivery capability will increase by approximately 30%.

In light of the well-documented projected energy shortages within the Long Island Sound coastal area, and the New York City, and New York City metropolitan markets, there is a demonstrated need for the Broadwater Project. The Broadwater Project will provide new molecules of natural gas to the region without the environmental impacts associated with construction of a large onshore energy terminal or additional onshore pipeline infrastructure.

#### ***The Broadwater Project Minimizes Adverse Impacts to the Coastal Areas of the Sound***

A site selection process was initiated in 2002 by analyzing alternatives to increase natural gas supplies to the area. Offshore areas that were considered included Block Island Sound, the Atlantic Ocean south of Long Island, as well as several areas within Long Island Sound. The preferred location was identified through a tiered screening process based on the

development and application of exclusion and preference criteria. The criteria considered included, among others, the following factors: weather; marine traffic conditions; proximity to major shipping lanes; proximity to densely populated areas; distance to existing pipeline infrastructure; location in State of New York waters; maintenance of an adequate safety buffer zone; minimum water depth of 66 feet (20 m); sensitive marine habitats and species; and geology and sediments.

The Broadwater Project is consistent with this policy's objectives to minimize adverse impacts from fuel storage facilities. The offshore FSRU location is the most viable and environmentally sound alternative when compared to those in other locations or using other technologies because:

- It is isolated outside of main shipping route areas, ensuring a safe distance between the FSRU and transiting commercial traffic;. WSR § 3.1.2.1.
- It poses the least amount of conflict with respect to other water-dependent commercial and recreational uses, including commercial and recreational fishing, existing vessel traffic transiting to and from New York's Ports, and recreational boating in Long Island Sound;
- It is in proximity to an existing pipeline that is adequately sized to accept natural gas to be delivered from the FSRU, thereby minimizing the need for new pipeline facilities;
- The Project avoids sensitive marine habitats, such as near shore shellfish habitats;
- It requires less seafloor area for mooring purposes than a gravity-based system (GBS);
- The FSRU provides a ship-like appearance consistent with the current visual canvas of the Sound;
- The FSRU ensures continual rather than intermittent supply of natural gas to the region because of its storage capabilities;
- The FSRU in its preferred location requires less ocean surface than an alternative using Shuttle Regasification Vessel (SRV) located off the Atlantic Coast of the Sound;
- Weather and marine related conditions in Block Island Sound and the Atlantic Ocean would result in significant periods when LNG carriers would be unable to unload cargo due to excessive relative motion between the vessel and the berth. This downtime would effectively compromise supply reliability and decrease viability;
- A significantly longer pipeline crossing Long Island Sound and/or an onshore pipeline and associated shore crossing sited across Long Island potentially would be required for any site in the Block Island Sound and Atlantic Ocean area, which would result in greater environmental impacts to the Long Island Sound seabed than the FSRU in its proposed location;

- The subsea interconnect with existing IGTS subsea pipeline eliminates the impacts of a pipeline shore crossing; and
- At the end of its useful life, the FSRU can be detached from mooring and towed away. This results in significantly less environmental impact than decommissioning a GBS.

Resource Report No. 10, Alternatives, provides further details on the alternatives and site selection analysis.

Decommissioning of the terminal following its useful lifespan will not result in any permanent impacts on the environment or waterfront lands because of the ease with which the FSRU can be disconnected from its mooring and moved. The remaining mooring tower could be removed or, alternatively, left in place and converted to aid navigation within the Sound. (see Resource Report No. 1, General Project Description at 1-80). Because major aspects of the Broadwater Project, including the FSRU, will be removed after its useful life, the impacts associated with the Project are temporary, reversible, and of relatively limited duration.

### ***The Broadwater Project Will Be Safely Located and Operated***

Significantly, the Broadwater Project will be safely sited and operated. Broadwater is committed to ensuring the safety of the residents, users, and natural resources of Long Island Sound. And the members of the Broadwater Project have deep experience in all aspects of the Project. The potential impacts of the storage of LNG are minimized with the preferred FSRU alternative in the preferred location, because the stored LNG will be 9 miles off the densely populated Long Island coastline. Thus, substantial safety concerns for Long Island's residents as a result of the Project are unfounded and the risk evaluations in the WSR demonstrate this point. See WSR § 1.4.4. Similarly, the distant, offshore location coupled with establishment of the Coast Guard recommended safety and security zone around the FSRU and LNG carriers traversing the Sound to and from the LNG terminal will afford protection and security to other users of the Sound, including commercial and recreational fishermen and boaters, and vessel use traffic within the Sound. There will be a minimal potential risk of ignition of an LNG carrier while in transit or moored at the FSRU that could potentially cause a threat to Long Island Sound's ecosystems. The LNG carriers will be constructed to meet all U.S. and international standards and, when at port, safety and precautionary zones will be enforced. The Project is being designed with many levels of spill prevention in place to avoid an LNG spill.

Broadwater has also completed a safety and reliability assessment to address potential disaster scenarios that could impact coastal resources. Potential hazards evaluated by Broadwater include pool fires, flammable vapor clouds, and rapid-phase transition, in addition to terrorist-related threats to shipments and LNG vessels. Multiple levels of safety will be in place to prevent problems from escalating beyond the immediate area, including radar and positioning systems to alert crew to traffic and other hazards around the vessel; primary and secondary barriers on storage tanks to prevent leakage or rupture; leak detection and mitigation through continual monitoring and emergency shutdown procedures; and establishment of a safety zone that extends beyond the FSRU and carriers. Further information about the results of Broadwater's safety and reliability assessment are contained in Resource Report No. 11, Safety and Reliability.

In addition, as part of the WSR, the Coast Guard developed Hazard Zones to assess the potential risks associated with a large spill of LNG into the water. WSR § 1.4 The Coast Guard looked to the criteria used by Sandia National Labs in their report, *Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water* (December 2004), to develop the three hazard zones and then used the hazard zones to assess the potential risks associated with the Project. WSR § 1.4.1.

Within the three zones, the level of risk reduces with an increasing distance from the source. For Zones 1 and 2, the outer limits are defined as the thermal radiation impacts (high potential or potential for major injuries or damage) that could be expected from an intense LNG vapor fire. Id. The outer limit of Zone 3 is based on the lower flammability limit of LNG vapor (i.e., the point at which a vapor cloud would disperse that it cannot be ignited). Id.

### Summary of Waterways Suitability Report Findings

The primary difference between the evaluations contained in the Sandia Report and those in the WSR relate to differences between the size of the LNG carriers considered by Sandia and those proposed by Broadwater. The size of the three hazard zones reported in the Sandia Report were based on large releases of LNG from LNG carriers with a capacity of 138,000-144,000 m<sup>3</sup>. The individual tank capacities were approximately 25,000 m<sup>3</sup>. The Sandia study assumed that about one-half of the tank volume was released, or 12,500 m<sup>3</sup>. *Sandia National Laboratories Report SAND2004-6258: Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water*, 2004, p. 141.

By way of contrast, the tank sizes for the FSRU and the maximum proposed LNG carrier size for the project (250,000 m<sup>3</sup>) are somewhat larger (approximately 42,000 to 45,000 m<sup>3</sup>) and therefore the volume of a potential release and the subsequent hazard zones will be somewhat larger than those estimated in the Sandia Report. WSR § 1.4.4.

The Federal Regulatory Energy Commission (FERC) conducted the consequence assessment for the WSR and conservatively determined that for the FSRU and the LNG carriers each of Zones 1 and 2 should be approximately 32 to 35% or 16 to 18% respectively larger than those established in the Sandia Report to account for larger potential spill volumes from the Project. Id.

The results of the Coast Guard's assessment conclude that because the FSRU is located in the central Sound none of Hazard Zones 1, 2 or 3 would overlap any portion of land. It was also concluded that no land areas along the LNG carrier transit route would fall within Hazard Zones 1 or 2. WSR §3.2.

Hazard Zone 3, which carries the least level of risk and conservatively extends out to 4.3 miles from the moving LNG carrier, would overlap the following land areas:

- Northern tip of Block Island, Rhode Island;
- Southern tip of Weekapaug Point, Westerly, Rhode Island;
- Southern tip of Watch Hill, Rhode Island;

- All of Fisher's Island, New York;
- All of Plum Island, New York;
- Northernmost third of the North Ford of eastern Long Island; and
- A portion of Goshen Point straddling the City of New London and the town of Waterford.

Id.

### Hazard Zone 3 Discussion

A further discussion of Hazard Zone 3 is appropriate. The analysis of this hazard zone followed the guidance provided in the Sandia Report for an intentional breach scenario. It should be noted that this assessment considers only the *consequence* of such a breach scenario, and does not consider the *probability* of occurrence of such a scenario. The Sandia Report's analysis made the following assumptions:

- A 5 m<sup>2</sup> hole size. This is a hole approximately 8 feet in diameter in a double-hulled LNG carrier. In the course of the Coast Guard's review, Broadwater submitted an evaluation of design data from different sized LNG carriers showing that larger future generation LNG carriers and the FSRU will have thicker inner and outer hull plate thickness and a larger horizontal distance between the outer and inner hulls compared to smaller LNG carriers currently in service, rendering large carriers less vulnerable to hull damage. This is therefore a conservative assumption. *Det Norkse Veritas for Broadwater Energy - Response to U.S. Coast Guard Letter Dated December 21, 2005, Report No. 70014347, February 13, 2006, pp. 2-5.*
- Intentional breach of 3 separate tanks.
- No ignition when the breach occurs. This is a conservative assumption, as the Sandia Report states: "*Most of the intentional damage scenarios identified produce an ignition source such that an LNG fire is likely to occur immediately.*" *Sandia Report*, p. 73. If the breach is ignited, the smaller Hazard Zones 1 and 2 are applicable.
- Calm atmospheric conditions, allowing the maximum drift of the vapor cloud. If the atmospheric conditions are less stable, the LNG vapor cloud will disperse more quickly and the extent of the vapor cloud will be reduced. Based on a review of annual average data for 1994 to 2004 by Broadwater, it was determined that the stable atmospheric conditions assumed in the Sandia Report only occur about 15% of the time.

The high degree of conservatism in this scenario is acknowledged in the Sandia Report, which states:

*While previous studies have addressed the vapor dispersion issue from a consequence standpoint only, the risk analysis performed as part of this study indicates the potential for a large vapor*



*dispersion from an intentional breach is highly unlikely. This is due to the high probability that an ignition source will be available for many of the initiating events identified, and because certain risk reduction techniques can be applied to prevent or mitigate the initiating events identified. Sandia Report, p. 53.*

Similar conclusions pertain to the application of this intentional breach scenario to the Broadwater Project.

### **Summary of Potential Coastal Zone Effects**

In conclusion, while the WSR assessed an intentional breach scenario that was generally consistent with that outlined in the Sandia Report, the potential for Hazard Zone 3 to impact land along the LNG carrier route is highly unlikely, due to the following:

- (1) The unlikely occurrence of the simultaneous intentional breach of three tanks without any spark that would cause ignition.
- (2) The limited occurrence of stable (F stability class) atmospheric conditions in Long Island Sound.
- (3) The established safety record of LNG carriers: "Over the approximately 45 years since the first marine shipment of LNG, more than 33,000 LNG carrier voyages have taken place. Transport of LNG in vessels has an excellent safety record: only eight marine incidents worldwide have resulted in LNG spills, some with damage. No cargo fires have occurred." WSR § 3.1.4.
- (4) The lack of credible terrorist threats against the facility. The WSR notes that "There are no known, credible threats against the proposed Broadwater Energy facility." WSR § 8.2.
- (5) The unlikelihood of the facility being considered a terrorist target, as noted by the Coast Guard in the WSR:

*"The current threat environment indicates a primary factor in the selection of targets by a terrorist organization such as al-Qa'ida is whether an attack could result in a significant loss of life. Another factor is that the target is readily accessible to the media so that the images of the attack can be quickly seen throughout the country and the world."*

*"There would normally be between 30 and 60 persons on the FSRU and between 20-25 crewmembers on an LNG carrier. While an attack against the FSRU or an LNG carrier would possibly result in loss of life, the proposed location is sufficiently remote that hazards Zones 1, 2, or 3 would not affect shoreside population centers. Second, the proposed location of the FSRU is relatively remote given the distance from shore and would not be broadly and readily accessible to the media or public. Based on the above*

*two criteria, the Broadwater Energy FSRU would more than likely not be an attractive terrorist target."* WSR § 5.2.1.

In sum, the design and siting location of the LNG terminal for the Broadwater Project will advance the objectives of promoting the use and development of energy resources and protecting and maintaining the coast's environmental resources that are at the heart of Policy 13. Furthermore, LNG facilities are expressly contemplated among the types of energy facilities that are suitable for and will potentially be sited in the Long Island Sound coastal area. The Broadwater Project will provide a new source of energy to the target markets where conservation measures alone are insufficient to address the rapidly growing demand. In addition, the Broadwater Project further satisfies the policy's objective of reducing dependence on imported oil for electric generation and home heating, by introducing a new, cleaner-burning and competitively-priced energy source, LNG, in a region in which it is largely unobtainable.

## **4.2 Applicable Local Waterfront Revitalization Plans<sup>13</sup>**

### **4.2.1 Town of Southold LWRP**

The Town of Southold is located at the extreme eastern end of Long Island, at the northern end of the peninsula known as North Fork. The entire Town, including Fishers, Plum and Robins Islands (in total there are five islands located within the jurisdiction of the Town), contain approximately 163 linear miles of coastline, with multiple harbor areas. The Town is never wider than 1.25 miles.

The mainland is mostly level or gently sloping; while the Long Island shoreline is characterized by steep bluffs and backed by wooded hills, giving way to land that gently slopes to the marshes and wetlands of the Peconic Estuary shoreline to the south. The Town is surrounded by the marine waters of Long Island Sound, Fishers Island Sound, Block Island Sound, Gardiners Bay, and the bays of the Peconic Estuary.

Broadwater has identified two onshore locations on Long Island that can provide the facilities needed to support the operation of the Broadwater Project, including a waterfront site in the Village of Greenport and a waterfront site in the Village of Port Jefferson. Although the Village of Greenport is an incorporated village within the Town of Southold, it is a separate governmental entity with its own approved-LWRP and, as such, Broadwater has addressed consistency of the Project's onshore facilities with the Village of Greenport's LWRP.

The Town of Southold has a DOS-approved LWRP, which received a concurrence determination from the OCRM (part of the NOAA's National Ocean Service program) in November 2005. Broadwater's coastal zone consistency analysis addresses this federally- and DOS-approved LWRP. The Town of Southold's LWRP follows and further refines the 13 coastal policies in the LIS CMP in an attempt to reflect the Town's local needs.

<sup>13</sup> Broadwater submits this consistency determination subject to and without waiver of any rights that Broadwater has or may have relative to the applicability or non-applicability of NYSDOS- and federally-approved LWRPs to the FSRU/YMS and interconnected pipeline because, *inter alia*, these offshore facilities are outside the regulatory boundaries for any approved LWRP due, among other things, to their location in the central portion of Long Island Sound, a minimum of 9 miles from the coast.

The Town has also incorporated a generic HMP in the LWRP. The HMP addresses waterside issues from a point extending seaward to the land. The waterside boundary of the Southold Harbor Management Area extends from the mean high water mark seaward, as defined in Southold LWRP Section I, Harbor Management Area Boundary at I-6 and Section IV - Harbor Management at IV-1 to IV-3. The landward side of the waterside boundary of the Southold HMP runs to the joint boundary between the Village of Greenport and the Town of Southold. (See Southold LWRP, Section I, Boundary at I-7).

Although Broadwater respectfully maintains that consistency with the Southold LWRP for the FSRU/YMS, the interconnection pipeline, and the onshore facilities is inapt because the facilities are outside the Southold coastal and waterside boundary, Broadwater has prepared an explicit evaluation of the Broadwater Project's consistency with the Southold LWRP. As Broadwater demonstrates in this submission, the Broadwater Project is consistent with and complies with the Southold LWRP as well as all of the LIS CMP and State CMP policies.

#### **4.2.1.1 History of the Town of Southold Waterfront**

The Town of Southold, officially founded in 1640, is considered the oldest English settlement New York State. The first settlers raised crops and, as more land became available, the Peconic Estuary became a center for shipping and shipbuilding. Other important industries during that time were pottery and brickmaking, which continued until the 1938 hurricane flooded the clay pits.

In the first half of the nineteenth century, Southold remained relatively isolated, although many vessels made port there. Grain, produce, cattle, and bricks were shipped to New England and upstate markets and later to Brooklyn and New York City. In 1856, the Southold wharf was built.

When the Village of Greenport was officially incorporated in 1838, shipbuilding and shipping was gradually transferred from Southold to Greenport. With the advent of the railroad in 1844, the Town changed and the sense of isolation ended as distant markets were brought close. Land values rose, farming methods modernized and the Town flourished. A more diversified economy was established, bringing in tourism. Southold, however, still remained largely an agricultural community.

The end of World War II brought more changes to Southold as the shipbuilding industry declined and improved modes of transportation and communication resulted in more rapid change and development.

Southold's economy has been based on three areas of activity: agriculture, maritime industries and tourism/recreation. The tourism/recreation sector of the economy is attributed to summer residents, vacationers and day-trippers seeking out the Town for its farms, beaches, water and land based recreational activities, and for its visual landscape. While farmland still dominates the landward vista and is the dominant visual feature, marine waters surround that landscape. The maritime industries comprise a wide range of businesses, from baymen and commercial fisherman, to marinas that provide services for recreational boaters and

fishermen. The primary focus of the Southold LWRP is on-water dependent and water-enhanced-uses.

#### 4.2.1.2 Consistency with Town of Southold Local Waterfront Revitalization Plan (LWRP)

**POLICY 1:** *Foster a pattern of development in the Town of Southold that enhances community character, preserves open space, makes efficient use of infrastructure, makes beneficial use of a coastal location, and minimizes adverse effects of development.*

This LWRP policy arguably applies only to the Southold waterfront and will not be applicable to the Broadwater Project because the Broadwater Project does not propose to construct any facilities in the coastal area boundary of the Town of Southold. (Southold LWRP, Section I-b, Boundary). Additional analysis of the issues addressed in this LWRP policy is contained in Broadwater's response to LIS CMP Policy 1, above.

For all of these reasons, the Broadwater Project is consistent with this LWRP policy.

**POLICY 2:** *Preserve historic resources of the Town of Southold.*

- 2.1 *Maximize preservation and retention of historic resources.*
- 2.2 *Protect and preserve archaeological resources.*
- 2.3 *Protect and enhance resources that are significant to the coastal culture of the Long Island Sound.*

This LWRP policy arguably applies exclusively to the Town of Southold waterfront and will not be applicable to the Broadwater Project because the on and offshore facilities will be outside the Southold coastal boundary. Additional analysis of the issues addressed in this LWRP policy is contained in Broadwater's response to LIS CMP Policy 2, above. *See also* Section 3.4 for a discussion of historic, cultural, and archaeological resources.

For all of these reasons, the Broadwater Project is consistent with this LWRP policy.

**POLICY 3:** *Enhance visual quality and protect scenic resources throughout the Town of Southold.*

- 3.1 *Enhance visual quality and protect scenic resources throughout the Town of Southold.*

The Broadwater Project is consistent with this LWRP policy because the Broadwater Project is protective of scenic resources throughout the Town of Southold. The Southold LWRP recognizes the importance of the visual quality of the coastal waterfront as a resource that has an economic and an aesthetic impact, and that the Town's visual character contributes to its reputation as a quality waterfront community. The Southold LWRP places high value on preserving the differing landforms, highly scenic natural resources, and cultural

resources to continue to Southold's "attraction and vitality as a year-round waterfront community." (Southold LWRP, Section III, Policies at 6).

To meet the goals of this policy, the Town has listed some of the following standards: minimizing the introduction of design components that would be discordant with existing natural scenic components and character; restoring deteriorated and removing degrading visual components; screening components of development; using appropriate siting, scales, forms and materials to ensure compatibility; protecting the visual interest provided by active water-dependent uses; and protecting visual quality associated with public lands by limiting water surface coverage or intrusion to the minimum amount necessary. (*see* Southold LWRP, Section III, Policies at 7).

The Broadwater Project is consistent with already visible views. For example, views from roads and public parks within the Town of Southold are "extensive and varied." Typical views include sights of harbor centers, Long Island Sound, and Orient Harbor, among others. While agriculture and open land is a strong component of the visual character of Southold, maritime views and activities also contribute to the visual quality of Southold and its sense of character.

As is noted in Broadwater's response to LIS CMP Policy 3, Broadwater has taken extensive measures in the design, coloration, configuration, and siting of the FSRU to protect the scenic resources within the Sound. Broadwater has also considered the potentially sensitive visual resources and vantage points within the Town of Southold as part of its December 5, 2005 completed VRA. (*see* VRA, Appendix K). In fact, Broadwater evaluated the potential visibility of the FSRU from twelve potentially visually sensitive receptors in the Town of Southold. The FSRU will not be at all visible from the Eastern Long Island Campground or the Mattituck Inlet Marina. (viewpoint [VP] LI01 and LI12, respectively). In addition, while the FSRU may be visible from other receptors in the Town of Southold, its visibility is limited largely as a result of its offshore location. In fact, in each instance, the FSRU will be at least 16 miles from potentially visible locations within the Southold coastal boundary. Broadwater has compiled photo simulations from multiple potentially sensitive receptor locations that depict the existing condition (i.e., without the Broadwater Project) and the proposed condition (i.e., with the Broadwater Project). These photo simulations are included as part of Broadwater's VRA. In particular, Broadwater completed photo simulations for Inlet Pond County Park (24.2 miles from FSRU) (*see* Appendix K, Figures A-3A, A-3B, A-3C (VP-LI01); Horton Point Lighthouse (20.9 miles from FSRU) (Appendix K, Figures A-4A, A-4B, A-4C (VP-LI04); and Breakwater Beach (15.9 miles from FSRU) (Appendix K, Figures A-5A, A-5B, A-5C (VP-LI11). These photo simulations confirm that the Broadwater Project will be consistent with features that already exist in Southold's view shed and will not create an unusually discordant feature on the Sound.

The presence of the FSRU and LNG carriers may diminish the aesthetic experience for those who believe that the Sound should be used strictly for recreational purposes. However, for those who recognize and understand that the Sound is a multi-purpose water body, the presence of the FSRU and LNG carriers will have little impact on their recreational experience, as these features are consistent with already existing facilities and vessels on the Sound. The ConocoPhillips Northville petroleum terminal and the Shoreham Energy Center (formerly the Shoreham Nuclear facility) are just two examples of such facilities. Similarly, vessels are already commonly-used for waterborne transportation within the Sound. This is

confirmed in the WSR which categorizes the entire transit route that LNG carriers would traverse as a multiple use waterway. WSR §§ 2, 2.2, 2.2.1, 3.2 and 8.2. In fact, numerous large vessels operate routinely on LIS. WSR § 2.2.1.1. The WSR states that deep draft vessels transiting LIS range in size from 500 to 902 feet in length and that those in excess of 800 feet in length generally carry petroleum or coal. *Id.* As such, LNG carriers will be consistent with existing features and will even present a point of visual interest for many observers.

For all of these reasons and those set forth in Broadwater's response to LIS CMP Policy 3 and the VRA, Broadwater is consistent with the objectives of this LWRP policy.

**POLICY 4:** *Minimize loss of life, structures, and natural resources from flooding and erosion.*

- 4.1 *Minimize losses of human life and structures from flooding and erosion hazards.*
- 4.2 *Protect and restore natural protective features.*
- 4.3 *Protect public lands and public trust lands and use of these lands when undertaking all erosion or flood control projects.*
- 4.4 *Manage navigation infrastructure to limit adverse impacts on coastal processes.*
- 4.5 *Ensure that expenditure of public funds for flooding and erosion control projects results in a public benefit.*
- 4.6 *The siting and design of projects involving substantial public expenditure should factor in the trend of rising sea levels.*

The Broadwater Project does not propose to locate any onshore facilities in Southold. Refer to Broadwater's response to LIS CMP Policy 4 above for a further discussion of compliance with this LWRP policy.

**POLICY 5:** *Protect and improve water quality and supply in the Town of Southold.*

- 5.1 *Protect direct or indirect discharges that would cause or contribute to contravention of water quality standards.*
- 5.2 *Minimize non-point pollution of coastal waters and manage activities causing non-point pollution.*
- 5.3 *Protect and enhance quality of coastal waters.*
- 5.4 *Limit the potential for adverse impacts of watershed development on water quality and quantity.*
- 5.5 *Protect and conserve the quality and quantity of potable water.*

The Broadwater Project does not propose to locate any onshore facilities in Southold. Therefore, there are no concerns about flooding or erosion due to onshore facilities. Refer to Broadwater's response to LIS CMP Policy 5 above for further discussion of the issues raised by this LWRP policy.



**POLICY 6:** *Protect and restore the quality and function of the Town of Southold's ecosystem.*

- 6.1 *Protect and restore ecological quality throughout the Town of Southold.*
- 6.2 *Protect and restore Significant Coastal Fish and Wildlife Habitats.*
- 6.3 *Protect and restore tidal and freshwater wetlands.*
- 6.4 *Protect vulnerable fish, wildlife, and plant species, and rare ecological communities.*

The Broadwater Project's facilities (i.e., the FSRU/YMS, the interconnection pipeline, and the onshore facilities) are outside Southold's coastal and waterside boundaries and thus, there are no issues regarding Broadwater's consistency with this LWRP policy. Refer to Broadwater's response to LIS CMP Policy 6 above for further discussion of the measures by which Broadwater's facilities will be in compliance with this LWRP policy.

**POLICY 7:** *Protect and improve air quality in the Town of Southold.*

- 7.1 *Control or abate existing and prevent new air pollution.*
- 7.2 *Limit discharges of atmospheric radioactive material to a level that is as low as practicable.*
- 7.3 *Limit sources of atmospheric deposition of pollutants to the Town of Southold, particularly from nitrogen sources.*

The Broadwater Project will be consistent with this LWRP policy because the introduction of a cleaner-burning energy source within the region will contribute to reduced emissions of acid rain precursors and other particulate matter. Refer to Broadwater's response to LIS CMP Policy 7 above for further discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 8:** *Minimize environmental degradation in the Town of Southold from solid waste and hazardous substances and wastes.*

- 8.1 *Manage solid waste to protect public health and control pollution.*
- 8.2 *Manage hazardous wastes to protect public health and control pollution.*
- 8.3 *Protect the environment from degradation due to toxic pollutants and substances hazardous to the environment and public health.*
- 8.4 *Prevent and remediate discharge of petroleum products.*
- 8.5 *Transport solid waste and hazardous substances and waste in a manner which protects the safety, well-being, and general welfare of the public; the environmental resources of the state; and the continued use of transportation facilities.*
- 8.6 *Site solid and hazardous waste facilities to avoid potential degradation of coastal resources.*

The Broadwater Project will be consistent with this LWRP policy. Broadwater is committed to using best management practices (BMPs) to avoid environmental degradation by

minimizing discharges of solid waste and hazardous substances and waste during the construction and operation of the project. Because the Broadwater Project does not propose to locate its onshore or offshore facilities in the Town of Southold coastal boundary, and because of the multiple measures that the Broadwater Project is taking to properly handle and where possible avoid the release of solid waste and hazardous substances and wastes, Broadwater has minimized the potential for environmental degradation of Long Island Sound, including Southold. Refer to Broadwater's response to LIS CMP Policy 8 above for further discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Section 2.1.2.8.1 regarding the Broadwater Project's waste and waste handling for further discussion and analysis regarding Broadwater's compliance with this LWRP policy.

**POLICY 9:** *Provide for public access to, and recreational use of, coastal waters, public lands, and public resources of the Town of Southold*

- 9.1 *Promote appropriate and adequate physical public access and recreation to coastal resources.*
- 9.2 *Protect and provide public visual access to coastal lands and waters from public sites and transportation routes where physically practical.*
- 9.3 *Preserve the public interest in and use of lands and waters held in public trust by the state and the Town of Southold.*
- 9.4 *Assure public access to public trust lands and navigable waters.*
- 9.5 *Provide access and recreation that is compatible with natural resource values.*

The Broadwater Project is consistent with and will comply with the objectives of this LWRP policy because Broadwater will protect and preserve public access to, and recreational use of, coastal waters, public lands, and public resources of the Town of Southold. As discussed above in Broadwater's response to Southold LWRP Policy 3, Broadwater is consistent with the objectives of this LWRP policy because it protects and does not restrict physical public visual access to coastal resources within the Sound. To the extent that the FSRU is located in navigable waters off the coast of Riverhead such that transiting LNG carriers must pass through waters off the Southold coast, the Broadwater Project will result in only limited, temporary restrictions on public access for safety and security purposes during such transit periods. Appendix J, Broadwater's LNG Carrier Route Analysis suggests that no major coastal features would be significantly impacted by the proposed LNG carrier or an associated USCG - recommended safety and security zone. Additionally, any such limitation would only be temporary. As is discussed in Broadwater's response to LIS CMP 9 above the estimated time restriction due to the safety and security zone surrounding a transiting LNG carrier is only 15 minutes.

It is significant that this LWRP policy recognizes that while maintaining public access to the coastal resources is an important goal, there are instances where the public use may be restricted in navigable waters for "water-dependent uses involving navigation and commerce which require structures or activities in water as part of the use." (Southold LWRP, Section III-41, Policy 9.4.E.2a). In fact, this LWRP policy states that "[t]he right of commercial navigation is superior to all other uses on navigable waters and may not be obstructed." (*Id.* at III-43-44, Policy 9.4.E.3a). Broadwater's business of receiving overseas sourced LNG at the FSRU and the

distribution of the LNG into the IGTS interconnection pipeline is water-dependent because it relies exclusively on waterborne transportation for the delivery of LNG and also on the existing infrastructure of the water-dependent IGTS pipeline. In other words, the Broadwater Project unquestionably relies upon waterborne commerce on the navigable waters of the Sound. Refer to Broadwater's response to LIS CMP Policy 9 above for further discussion of the Broadwater Project's compliance with this LWRP policy. *See also*, Section 3.6.3.3, above.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 10:** *Protect the Town of Southold's water-dependent uses and promote siting of new water-dependent uses in suitable locations.*

- 10.1(a) *Protect existing water-dependent uses.*
- 10.1(b) *Improve the economic viability of water-dependent uses by allowing for non-water dependent accessory and multiple uses, particularly water enhanced and maritime support services where sufficient upland exists.*
- 10.2 *Promote Mattituck Inlet and Creek, Mill Creek and the Village of Greenport as the most suitable locations for water-dependent uses within the Town of Southold.*
- 10.3 *Allow for continuation and development of water-dependent uses within the existing concentration of maritime activity in harbors, inlets and creeks.*
- 10.4 *Minimize adverse impacts of new and expanding water-dependent uses and provide for their safe operation.*
- 10.5 *Provide sufficient infrastructure for water-dependent uses.*
- 10.6 *Promote efficient harbor operation.*

The Broadwater Project does not propose to locate on or offshore facilities in the Town of Southold. Therefore, the Broadwater Project will not affect and will protect the Town of Southold's water-dependent uses. For further discussion regarding Broadwater's water-dependency and the suitability of its proposed location in the center portion of Long Island Sound, refer to Broadwater's response to LIS CMP Policy 10, above.

**POLICY 11:** *Promote sustainable use of living marine resources in Long Island Sound, the Peconic Estuary and Town waters.*

- 11.1 *Ensure the long-term maintenance and health of living marine resources.*
- 11.2 *Provide for commercial and recreational use of the Town of Southold's finfish, shellfish, crustaceans, and marine plants.*
- 11.3 *Maintain and strengthen a stable commercial fishing fleet in the Town of Southold.*
- 11.4 *Promote recreational use of marine resources.*
- 11.5 *Promote managed harvest of shellfish originating from uncertified waters.*
- 11.6 *Promote aquaculture.*

The Broadwater Project is consistent with the objectives and goals of this LWRP policy, because the placement of the FSRU in the central portion of the Sound will result in the least effects on living marine resources within Long Island Sound, including those marine resources within the Town of Southold. This is so because the FSRU is placed away from, among other things, the nearshore habitats of shellfish within the Sound. Refer to Broadwater's responses to LIS CMP Policies 6 and 11 above for further discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 12:** *Protect agricultural lands in the Town of Southold.*

- 12.1 *Protect agricultural lands from conversion to other land uses.*
- 12.2 *Establish and maintain favorable conditions which support existing or promote new coastal agricultural production.*
- 12.3 *Minimize adverse impacts on agriculture from unavoidable conversion of agricultural land.*
- 12.4 *Preserve scenic and open space values associated with the Town's agricultural lands.*

The Broadwater Project does not propose to locate onshore facilities in the Town of Southold. Therefore, the Broadwater Project will not affect agricultural lands in the Town of Southold. Refer also to Broadwater's response to LIS CMP Policy 12 above for further discussion of the issues raised by this LWRP policy.

**POLICY 13:** *Promote appropriate use and development of energy and mineral resources.*

- 13.1 *Conserve energy resources.*
- 13.2 *Promote alternative energy sources that are self-sustaining, including solar and wind powered energy generation.*
- 13.3 *Ensure maximum efficiency and minimum adverse environmental impact when siting major energy generating facilities.*
- 13.4 *Minimize adverse impacts from fuel storage facilities.*
- 13.5 *Minimize adverse impacts associated with mineral extraction.*

The Broadwater Project does not propose to locate its onshore or offshore facilities in the Town of Southold. The Broadwater Project is appropriately located in the central portion of Long Island Sound, and is sited to promote the appropriate use and development of energy resources within Long Island Sound. The Broadwater Project's selected location will not significantly affect the Town of Southold. Additionally, the objectives of this LWRP policy are identical to those set forth in LIS CMP Policy 13. Like LIS CMP Policy 13.4, this Greenport LWRP policy also plainly identifies LNG facilities as the type of LNG facilities that would be sited and suitable in the Sound. Therefore, even assuming this LWRP policy applies to the FSRU, the Broadwater Project is consistent with this LWRP policy. Refer to Broadwater's response to LIS CMP Policy 13 above for further discussion of issues raised by this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

#### **4.2.2 Village of Greenport LWRP**

The Village of Greenport is approximately one square mile located within the Town of Southold and situated on the eastern end of the North Fork of Long Island, Suffolk County. Much of the Village's development and vitality is due to its waterfront location. From the early 1830's to 1849, schooners from all over the world sailed from Greenport to Sag Harbor. In 1835, and continuing up until the mid-1900's, the menhaden (moss bunker) fishing industry had a major impact on Greenport and "fish factories" were established along the Greenport waterfront. The fish were harvested and used for their oils, as a farm fertilizer and for animal food. Also at the turn of the century, and continuing up until the early 1960's, oystering was a major industry in Greenport.

The entire Village of Greenport is within the coastal area boundary. The waterside boundary of Greenport's coastal area is the same as the Village's legal jurisdictional boundary and extends out from the shoreline into Shelter Island Sound encompassing the waters, known as Greenport Harbor, landward of the waterside boundary connecting Young's Point and Fanning Point. Greenport Harbor is composed of the deep waters off the Village Center and a shallow inland waterbody called Stirling Basin. Greenport Harbor is reached through Gardiners Bay, which opens to the Atlantic Ocean and Long Island Sound to the east.

#### 4.2.2.1 History of the Village of Greenport Waterfront

Greenport prospered as a result of the menhaden industry and the growing shipbuilding industry. By the 1950's, the menhaden industry had declined due to the modernization of fishing and processing techniques and the decrease in menhaden abundance.

During World War II, Greenport's shipyards became very active building naval vessels under government contract. The shipyards closed after the end of the war and, over the next 25 years, the Village economy went into severe decline. After the war, the mainstay of Greenport's economy was the fishing industry.

Recently, tourism and the number of second home owners have increased attracted by Greenport's commercial waterfront, shops, restaurants, and the architecturally distinctive homes. These factors have had an influence on Greenport's economy, resulting in the development and redevelopment of vacant, deteriorated, or underutilized properties along the waterfront in the Central Business District (CBD). With tourism and recreational boating demands increasing, dock space for commercial vehicles is in tight demand. This is compounded by the increasing demand for development of waterfront properties as tourist facilities or luxury condominiums. While today the local labor market does not depend as heavily as it once did on traditional maritime industries, the majority of the local labor market still relies on water-dependent occupations such as marinas, boat yards, commercial fishing, and boat building.

The Village's waterfront area is divided into three waterfront areas: Waterfront Area 1, Waterfront Area 2 and Waterfront Area 3. The CBD encompasses waterfront areas most of Greenport's retail commercial uses are found in this area. A coordinated program of building rehabilitation, infill development, and public improvement will improve the visual quality and economic vitality of the Village. Recently, the number of recreational boats and the demand for docking facilities for them have nearly eliminated the available dock space for commercial fishing vessels.

#### 4.2.2.2 Consistency with Village of Greenport Program (LWRP)

The Village of Greenport LWRP follows the 44 coastal policies in the NYS CMP.

The Village of Greenport has a draft HMP, dated December 17, 1998, that has not yet been finalized and/or approved. As discussed above, the Greenport Harbor is composed of the deep waters off the Village Center and a shallow inland waterbody called Stirling Basin. Greenport Harbor is reached through Gardiners Bay, which opens to the Atlantic Ocean and Long Island Sound to the east. In 1997, the NYSDOS identified the Village of Greenport as one of 17 maritime centers in the State in its report entitled *Long Island Sound Historic Centers of Maritime Activity*. The report proposed to reverse the decline of maritime centers and their working waterfronts. (HMP at 2-9).

To preserve the historic maritime character and encourage it to grow, the Greenport LWRP lists guidelines and standards to be used to determine consistency of proposed actions. One of the standards and guidelines to be followed is that the action "will not detract



from views of the water, particularly where the visual quality of the area is an important component of the area's appeal and identity." (Greenport LWRP at III-10).

Broadwater's analysis of its consistency with the Greenport LWRP is set forth below.

**POLICY 1:** *Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial and industrial, cultural, recreational and other compatible uses.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because the use of existing buildings to support its onshore business support facilities in Greenport will maintain existing, compatible uses that are an important part of Greenport's community character. Refer to Broadwater's response to LIS CMP Policy 1 above for further discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 1A:** *Revitalize Greenport's waterfront area by redeveloping deteriorated/underutilized properties and buildings for appropriate commercial and recreational uses.*

Refer to Broadwater's response to Greenport LWRP Policy 1 above for a discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 1B:** *Revitalize Greenport's central business district by restoring underutilized properties and buildings for appropriate retail commercial and other compatible uses.*

The Broadwater Project will be consistent with this LWRP policy because Broadwater will use existing buildings in Greenport to house its business support facilities. The placement of Broadwater's onshore facilities in Greenport in already existing buildings will avoid additional pressures on limited open space and visual access to the Greenport waterfront. Broadwater will ensure that its onshore facilities do not "affect existing views in an insensitive manner." (Greenport LWRP at III-5). For additional discussion regarding Broadwater's consistency with this LWRP policy, refer to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

**POLICY 2:** *Facilitate the siting of water-dependent facilities on or adjacent to coastal waters.*

The Broadwater Project is consistent with the objectives and goals of this LWRP policy, as waterfront onshore facilities in the Village of Greenport will be necessary for the operation of Broadwater's water-dependent business. For example, Broadwater's use of existing buildings on the Greenport waterfront adjacent to the water will support Broadwater's transfer of people, equipment, and cargo to the FSRU. In addition, Broadwater will use such waterfront locations to moor vessels used for these operations. Refer to Broadwater's response to LIS CMP Policy 10 above for further discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 3:** *The state coastal policy regarding major ports is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone. Refer to Broadwater's response to State Coastal Management Program Policy 3 below for further discussion.

**POLICY 4:** *Strengthen the economic base of small harbor areas by encouraging the development and enhancement of those traditional uses and activities which have provided such areas with their unique maritime identity.*

The Broadwater Project is consistent with the goals and objectives of this policy as the Broadwater Project will maintain the marine-based character of Greenport's LWRP working waterfront. In particular, Broadwater's onshore business support facilities will be consistent with certain traditional waterfront uses, such as docking of vessels used to support commerce within the Sound. Thus, while not as much of Greenport's waterfront is used today for the traditional industries of commercial fishing and shipbuilding as in the past, Broadwater's onshore operations in Greenport will be consistent with the traditional uses found along the waterfront, including ship repair, building and storage yards, fish marketing, processing and packaging, dockage facilities, marine contracting for docks, jetties and bulkheads, and marine supplies. The Greenport LWRP states: "It is the presence of these traditional maritime uses, their related sounds, the smell of the salt air and freshly caught fish, the noise and visual impact of harbor and sea bound vessels, and the architecturally rich resources of the village which comprise the traditional maritime character of Greenport." (Greenport LWRP at III-9). Broadwater's onshore operations in Greenport will be respectful of the LWRP's identification of Greenport as "an outstanding example of an historic small harbor with a maritime identity." (Greenport LWRP at III-9).

Refer to Broadwater's response to LIS CMP Policy 1 above for further discussion of the Broadwater Project's compliance with this LWRP policy. Refer also to Broadwater's discussion of economic benefits and effects that are anticipated with the Broadwater Project as set forth in Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 5:** *Encourage the location of development in areas where public services and facilities essential to such development are adequate, except when such development has special functional requirements or other characteristics which necessitates its location in other coastal areas.*

The Broadwater Project will be consistent with this LWRP policy because the proposed onshore facilities that will be located in Greenport are not anticipated to have unusual or special functional requirements. The existing public services in the Village of Greenport will

be adequate to support Broadwater's onshore facilities that are located there. Broadwater will coordinate with Greenport's emergency services and other public service departments as necessary to ensure adequate communication regarding Broadwater's business operations at its Greenport locations.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 5A:** *Maintain and where necessary improve public services and infrastructure which serve the village waterfront area and central business district to assure their continued availability to meet existing and limited future development needs.*

Refer to Broadwater's response to Greenport LWRP Policy 5 above for a discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 6:** *Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.*

The Broadwater Project does not anticipate that it will require any permits from the Village of Greenport for its onshore business support locations, which will use existing buildings in properly zoned and thus, suitable locations. Onshore facilities operators will comply with applicable permitting requirements. Refer to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O, for additional discussion of issues raised by this LWRP policy.

**POLICY 7:** *The state coastal policy regarding the protection of significant coastal fish and wildlife habitats is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 8:** *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sublethal or lethal effect on those resources.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because it will protect marine and living resources in the coastal area from the introduction of hazardous wastes and other pollutants that can bio-accumulate in the food chain or cause significant sublethal or lethal effect on those resources.

Refer to Broadwater's response to LIS CMP Policy 8 above for further discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Section 2.1.2.8.1 regarding the Broadwater Project's waste and waste handling for further discussion and analysis regarding Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 9:** *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources. Such efforts shall be made in a manner which ensures the protection of renewable fish and wildlife resources and considers other activities dependent on them.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy as a result of its Social Investment Program, which will review with stakeholders the options of establishing a social investment fund or foundation for the funding of regional projects that will benefit the environment and the public alike. Such funding could, among other things, result in increased access to existing fish and wildlife resources in Long Island's coastal areas, including Greenport, as well as the development of new or additional resources. A more detailed discussion of Broadwater's Social Investment Program is set forth in Appendix L.

**POLICY 10:** *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by: (i) encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities; (ii) increasing marketing of the state's seafood products; and (iii) maintaining adequate stocks and expanding aquaculture facilities. Such efforts shall be in a manner which ensures the protection of such renewable fish resources and considers other activities dependent on them.*

The Broadwater Project is consistent with this LWRP policy to the extent that the placement of the FSRU in a distant, offshore location preserves and protects existing marine resources, including finfish, shellfish and crustaceans, in the Long Island Sound area, including such resources in Greenport. The Broadwater Project does not propose to place or operate facilities in the Village of Greenport that conflict with the objectives of this policy.

See also Broadwater's Essential Fish Habitat Assessment, which is annexed as Appendix G, Broadwater's Fishermen Outreach Survey, which is annexed as Appendix H, and Broadwater's Social Investment Program, annexed as Appendix L, for additional discussion and analysis establishing Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 10A:** *Encourage the development of new, or expanded commercial fishing facilities in Greenport, and protect existing commercial fishing facilities from encroachment by potentially conflicting land uses.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because Broadwater's onshore business support facilities in Greenport will be located in existing buildings and these land uses will not encroach on existing commercial fishing facilities within the Village of Greenport.

**POLICY 11:** *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

The Broadwater Project will utilize existing facilities in Greenport for its onshore business support locations. The use of such facilities is likely to avoid damage to property due to flooding and erosion. Refer to Broadwater's response to LIS CMP Policy 4 above for additional discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O, regarding Broadwater's proposed onshore facilities in Greenport.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 12:** *Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs. Primary dunes will be protected from all encroachments that could impair their natural protective capacity.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because business related activities that will take place in the Greenport coastal area, will be located in existing buildings along the coast and will not affect natural resources or other property due to flooding and erosion. Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 13:** *The state coastal policy regarding the protection of erosion protective features is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 13A:** *The construction or reconstruction of docks, seawalls, revetments, bulkheads, breakwaters, and other shoreline structures shall be undertaken in a manner which will, to the maximum extent practicable, protect against or withstand the destructive forces of wave action and ice movement for a thirty year period.*

The Broadwater Project will comply with this requirement of docks, seawalls, revetments, bulkheads, breakwaters, or other shoreline structures that are required as part of its onshore business support facilities in Greenport. Currently, no such facilities are anticipated. Any such structure would be constructed only in accordance with applicable standards. For additional discussion regarding Broadwater's consistency with this LWRP policy, refer to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 14:** *Activities and development including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.*

Refer to Broadwater's response to LIS CMP Policy 4, and Greenport LWRP Policies 12, 13 & 13A above for a discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 15:** *Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.*

The Broadwater Project is consistent with the goals and objectives with this LWRP policy as there will be no mining, excavation or dredging in coastal waters within Greenport's coastal boundary that could interfere with the natural coastal processes. Trenching activities for the purposes of Broadwater pipeline will not interfere with the natural coastal processes, including those that are the focus of this policy. Refer also to Broadwater's response to LIS CMP Policy 4 above for additional discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.



**POLICY 16:** *Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.*

As the Broadwater Project will not receive public funds, this LWRP policy does not apply to the Broadwater Project.

**POLICY 17:** *Whenever possible, use non-structural measures to minimize damage to natural resources and property from flooding and erosion. Such measures shall include: (i) the set back of buildings and structures; (ii) the planting of vegetation and the installation of sand fencing and draining; (iii) the reshaping of bluffs; and (iv) the flood-proofing of buildings or their elevation above the base flood level.*

The Broadwater Project is consistent with the goals and objectives of this policy because Broadwater's use of existing buildings in the Village of Greenport makes use of in-place infrastructure that is unlikely to be subject to flooding and erosion due to the elevation of such buildings above the base flood level. It is unlikely that there will be a need to alter the physical location of the primary structures of Broadwater's onshore facilities. If Broadwater's onshore facilities may be exposed to flooding and erosion, Broadwater will, when possible, use non-structural measures to minimize damage to natural resources and property from flooding and erosion, including the use of vegetation and sand fencing and draining. Refer also to Broadwater's Onshore Facilities Resource Reports for additional discussion of issues raised by this policy, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 18:** *To safeguard the vital economic, social and environmental interest of the state and its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the State has established to protect valuable coastal resource areas.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because it has given full consideration to the economic, social, and environmental interests of the State and its citizens and to the safeguards that the State has established to protect valuable coastal resource areas. Refer to Broadwater's response to LIS CMP Policies 1, 2, 3, 5, 6, 7, 8, 9, 10, 11 above for a discussion of the Broadwater Project's compliance with this LWRP policy. See also Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, annexed as Appendix F, for further confirmation of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 19:** *Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities so that these resources and facilities may be fully utilized by all the public in accordance with reasonably anticipated public recreation needs and the protection of historic and natural resources. In providing such access, priority shall be given to public beaches, boating facilities, fishing areas and waterfront parks.*

The Broadwater Project will be consistent with this LWRP policy as it will be protective and respectful of the level and types of access to public water-related recreation as well as historic and natural resources. Broadwater's use of existing buildings for its onshore business support facilities will protect existing waterfront access for the public, as well as historic and natural resources. Refer to Broadwater's response to LIS CMP Policy 9 above for a discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F, and Broadwater's Marine/Land Use Compatibility Assessment, which is annexed as Appendix E, for further confirmation of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 20:** *Access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned shall be provided, and it should be provided in a manner compatible with adjoining uses. Such lands shall be retained in public ownership.*

The Broadwater Project will be consistent with the goals and objectives of this LWRP policy because it will not limit access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned. Broadwater's water-dependent business support operations that take place in the Village of Greenport would be consistent with existing waterfront uses in those locations. Refer to Broadwater's response to LIS CMP Policy 9 above for further discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Broadwater's Marine/Land Use Compatibility Assessment, which is annexed as Appendix E.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 20A:** *Access to the publicly owned foreshore and to lands immediately adjacent to the foreshore or the water's edge shall be provided through the creation of a harborwalk in Waterfront Area 2.*

The Broadwater Project will be consistent with the goals and objectives of this LWRP policy because Broadwater's permanent onshore facilities in the Village of Greenport, which will include leased land required for office space, warehousing, and a waterfront facility, will not impact access to the publicly owned foreshore and to lands immediately adjacent to the foreshore or the water's edge. To the extent that Broadwater's onshore business support operations will be located on leased property in Waterfront Area 2, Broadwater will ensure that

its operations are consistent and will not interfere with the objectives of this LWRP policy. Refer also to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O, for additional discussion of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 21:** *Water-dependent and water-enhanced recreation will be encouraged and facilitated, and will be given priority over non-water related uses along the coast, provided it is consistent with the preservation and enhancement of other coastal resources and takes into account demand for such facilities. In facilitating such activities, priority shall be given to areas where access to the recreation opportunities of the coast can be provided by new or existing public transportation services and to those areas where the use of the shore is severely restricted by existing development.*

The Broadwater Project is consistent with this LWRP policy because Broadwater's onshore business support operations in waterfront locations will be water-dependent, including the mooring of tugs and FSRU support vessels, and access for vessels transporting people and cargo between shore and the FSRU. The proposed site for the Broadwater Project onshore facilities in Greenport is located in Waterfront Areas 1 and 2. The selection of this location is consistent with the goals of the Greenport LWRP, to protect and maintain water-dependent uses and enhance the Village as a commercial and business center, among others. Refer to Broadwater's response to LIS CMP Policy 10 above for a discussion of the Broadwater Project's compliance with this LWRP policy. Refer also to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 21A:** *Redevelop the Mobil site for public waterfront recreational use.*

The Mobil site that is the subject of this LWRP policy is located in Waterfront Area 3. As the specific parcels proposed for Broadwater's onshore facilities in Greenport fall within areas designated as Waterfront Area 1 and Waterfront Area 2, this LWRP policy does not apply to the Broadwater Project.

**POLICY 22:** *Development, when located adjacent to the shore, will provide for water-related recreation, as a multiple use, whenever such recreational use is appropriate in light of reasonably anticipated demand for such activities and the primary purpose of the development.*

The Broadwater Project, which will lease property for its proposed onshore business support facilities on Greenport's waterfront, will serve the primary purpose of providing marine transfer of people, equipment, and FSRU support vessels. Because the primary purpose of these onshore facilities will be part of the existing, working waterfront, it is unlikely that Broadwater's operations on these leased properties will provide for water-related recreation at such locations. Such water-related recreation may be provided elsewhere in the Long Island Sound coastal area, including, among other places, Greenport, as part of Broadwater's Social Investment Program. Refer to Broadwater's response to LIS CMP Policy 10 above for a discussion of the Broadwater Project's compliance with this LWRP policy. Refer also to Broadwater's Onshore Facilities Resource Reports, which is annexed as Appendix O, and to Broadwater's Social Investment Program, which is annexed as Appendix L.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 23:** *Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the state, its communities, or the nation.*

The Broadwater Project is consistent with this LWRP policy because its proposed location for onshore business support facilities in Greenport does not contain resources listed or eligible for listing in the NRHP or known archaeological sites. Two sites listed on the NRHP – the Greenport Railroad Station and the Greenport Village Historic District – are directly adjacent to the proposed location from the north and west, respectively. For additional discussion regarding the existing site conditions pertaining to historic, archaeological, and cultural resources, refer to Existing Site Conditions, Chapter 3.4.2, above. Refer also to Broadwater's Onshore Facilities Resource Reports at Section 4-1 to 4-2, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 24:** *The state coastal policy regarding scenic resources of statewide significance is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 25:** *Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance but which contribute to the overall scenic quality of the coastal area.*

The Broadwater Project is consistent with this LWRP policy because Broadwater's proposed location for the FSRU as well as its onshore locations in the Village of

Greenport are respectful of natural and man-made resources in the Long Island Sound coastal area, including Greenport, that are not identified as being of statewide significance but that contribute to the overall scenic quality of the area.

Broadwater's proposal for onshore facilities in Waterfront Areas 1 and 2 is consistent with the existing visual features in the surrounding area, which vary widely from rugged, bulkheaded shorelines, with areas of natural beach and maritime vegetation, to historic waterfront commercial and residential settlements. These elements, combined with varied and "spectacular views," all contribute to making Greenport's shoreline a "unique and valuable waterfront resource of high visual quality." (Greenport LWRP at III-29-30). Preserving and protecting the small harbor character and architecturally rich resources of the Village will further the goal of improving the scenic quality in the Village. (Greenport LWRP at III-30). Broadwater's business support operations will continue and be consistent with Greenport's character as a working waterfront.

For additional discussion regarding the Broadwater Project's consistency with this LWRP policy, refer to Broadwater's responses to LIS CMP Policies 1, 3, 9, above. *See also* Existing Conditions Section 3.6.4, above. Refer also to Broadwater's Land/Marine Use Conflict Assessment and Long Island Sound Use Patterns and Trends Analysis, which are annexed as Appendix E and Appendix N, and Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 26:** *The state coastal policy regarding the protection of agricultural lands is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 27:** *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment, and the facility's need for a shorefront location.*

The Broadwater Project is consistent with this LWRP policy because the LNG terminal and interconnection pipeline will not be sited or constructed in the Village of Greenport. In fact, Broadwater proposes only to locate business support facilities at existing, onshore locations in the Village of Greenport. The leased facilities that Broadwater proposes would support operations that are consistent with the Village's heritage and character, which is closely connected to the Sound. (Greenport LWRP at III-31). For additional discussion regarding the Broadwater Project's consistency with this LWRP policy, refer to Broadwater's responses to LIS CMP Policies 1, 10 and 13, above. Refer also to Broadwater's Land/Marine Use Conflict Assessment, annexed as Appendix E, the Long Island Sound Use Patterns and Trends Analysis, annexed as Appendix N, and Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 28:** *The state coastal policy regarding ice management is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 29:** *Encourage the development of energy resources on the outer continental shelf, in Lake Erie and other water bodies, and ensure the environmental safety of such activities.*

The Broadwater Project is consistent with this LWRP policy because it will introduce a new supply of natural gas into the target markets, using the abundant and vast waters of Long Island Sound. Broadwater's selected location for its LNG terminal and interconnection pipeline in the central portion of Long Island Sound avoids safety issues that would otherwise be relevant to an onshore LNG facility. Here, the Village of Greenport will be a minimum of 15 miles away from the FSRU from any given location within the Village. Additional discussion regarding the Broadwater Project's consistency with this LWRP policy is set forth in Broadwater's responses to LIS CMP Policies 1, 5, 8, and 13, above. Refer also to Broadwater's reports on Water and Sediment Quality and Air Quality, which are annexed as Appendix A and Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 30:** *Municipal, industrial, and commercial discharge of pollutants including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.*

Consistent with this LWRP policy, Broadwater will comply with state and national water quality standards that are applicable to the Broadwater Project. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 5. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 31:** *State coastal area policies and purposes of approved local waterfront revitalization programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already overburdened with contaminants will be recognized as being a development constraint.*

The Broadwater Project will operate consistent with applicable water quality standards. In addition, because Broadwater will be using existing facilities for its proposed onshore locations in Greenport, no water quality impacts from construction or operation of the proposed onshore facilities are anticipated. Additional analysis and discussion confirming the Broadwater Project's consistency with this LWRP policy is set forth in Broadwater's response to LIS CMP Policy 5. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 32:** *The state coastal policy regarding the use of alternative sanitary waste systems is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 33:** *Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.*

Broadwater will use BMPs to control stormwater runoff and combined sewer overflows draining into coastal waters for any onshore facilities located in the Village of Greenport consistent with this LWRP policy. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 5. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 34:** *Discharge of waste materials into coastal waters from vessels will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.*

The Broadwater Project is consistent with this LWRP policy because Broadwater will operate in a manner that is protective of significant fish and wildlife habitats and recreational areas. The Broadwater Project is not anticipated to impact water supply areas within the Long Island Sound coastal region, including the Village of Greenport. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 5. Refer also to Broadwater's report on Water and



Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 35:** *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

This LWRP policy arguably applies only to the waters within the coastal boundary of the Village of Greenport. Because the FSRU will be placed outside of the Greenport coastal boundary in a distant, offshore location, the Broadwater Project eliminates the need for dredging that would likely be necessary to accommodate the draft of LNG carriers servicing an onshore LNG terminal. No dredging at the existing facilities in the Village of Greenport to accommodate tugs or other vessels is anticipated as a result of the Project. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in the Project Description set forth in Chapter 2, Section 2.2 *et seq.*, above. *See also* Broadwater's Onshore Facilities Resource Reports, Section 1.2 at 1-6, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 36:** *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

This LWRP policy ostensibly applies only to activities within the Greenport coastal boundary. The Broadwater Project is consistent with this LWRP policy as Broadwater will employ multiple measures to ensure the proper storage and shipment of petroleum and other hazardous materials to prevent or minimize the potential for spills into coastal waters. For proposed onshore facilities located in the Village of Greenport, there will be no bulk storage of fuel required. Material handling at the waterfront facilities will involve the transfer of certain containerized liquids, such as aqueous ammonia and mercaptan. The liquid transfers would be facilitated by the use of isotanks to ensure the safe transfer of such materials and minimize the potential for a spill or discharge. The onshore facilities will also provide an emergency response center for the Broadwater Project to ensure that the cleanup of any accidental discharges is expedited.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 8. *See also* Broadwater's Onshore Facilities Resource Reports, Section 1 at 1-1 to 1-7 and Section 2.2, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 37:** *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.*

This LWRP policy ostensibly applies only to discharges within the Greenport coastal boundary. Broadwater will employ multiple measures to minimize non-point discharge of excess nutrients, organics, and eroded soils into coastal waters consistent with this LWRP policy. The proposed locations for onshore facilities in the Village of Greenport are already developed, paved locations. The Broadwater Project will not result in significant movement of land or excavation of these already developed locations. As such, the Broadwater Project will not result in uncontrolled or excessive non-point discharge of nutrients, organics and eroded soils into the coastal waters surrounding the Village of Greenport.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 8. *See also* Broadwater's Onshore Facilities Resource Reports, Section 1 at 1-1 to 1-7 and Section 2.2, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 38:** *The quality and quantity of surface water and groundwater supplies will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.*

The Broadwater Project is consistent with this LWRP policy because the onshore, business support facilities and related operations that are proposed for the Village of Greenport are not anticipated to result in impacts to the surface water or groundwater supplies. Additional analysis and discussion confirming the Broadwater Project's consistency with this LWRP policy is set forth in Broadwater's response to LIS CMP Policy 5. *See also* Broadwater's Onshore Facilities Resource Reports, Section 2.2 at 2-1 to 2-3, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 39:** *The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural lands and scenic resources.*

The Broadwater Project will be consistent with this LWRP policy because any transportation, storage, treatment, and disposal of solid wastes, particularly hazardous wastes, within the Greenport coastal area will be protective of groundwater and surface water supplies, fish and wildlife habitats, recreation areas, agricultural lands, and scenic resources. A discussion of the fish, vegetation, and wildlife habitat that exists at the proposed Greenport location for

Broadwater's onshore facilities is set forth in Broadwater's Onshore Facilities Resource Reports, Section 2.2 and Section 3.1 at 3-1 to 3-8, annexed as Appendix O. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 8.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 40:** *The state coastal policy regarding effluent discharged from electric generating and industrial facilities is not applicable to the Village of Greenport.*

As explicitly stated, this LWRP policy does not apply to the Greenport coastal zone.

**POLICY 41:** *Land use or development in the coastal area will not cause national or state air quality standards to be violated.*

The Broadwater Project is consistent with this LWRP policy because it will not cause national or state air quality standards to be violated. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's report addressing Air Quality, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 42:** *Coastal management policies will be considered if the State reclassifies land areas pursuant to the Prevention of Significant Deterioration regulations of the Federal Clean Air Act.*

This LWRP policy is not applicable to the Broadwater Project.

**POLICY 43:** *Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.*

The Broadwater Project is consistent with this LWRP policy because it will meet applicable national or state air quality standards. Moreover, the introduction of a new supply of natural gas to the target markets is expected to improve air quality. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's report addressing Air Quality, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 44:** *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

The Broadwater Project is consistent with this LWRP policy because there are no freshwater wetlands or NWI wetlands within or adjacent to the proposed location for onshore facilities in the Village of Greenport. Refer also to Broadwater's Onshore Facilities Resource Reports, which is annexed as Appendix O, for additional discussion of issues raised by this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

#### **4.2.3 Town of Smithtown LWRP**

The Town of Smithtown has an approved LWRP that received OCRM concurrence on September 7, 1989. In June 2004, the Town submitted an amendment to the NYS DOS to update the 1989 LWRP to reflect local environmental and development conditions and to conform the LWRP with the LIS CMP.<sup>14</sup>

The Town of Smithtown is located in the northwest part of Suffolk County and is bounded on the north by Long Island Sound, and on the west, south and east by the towns of Huntington, Islip and Brookhaven, respectively. The Waterfront Revitalization Area boundary includes the shoreline of Long Island Sound, along with the Nissequogue River and Stony Brook Harbor, which are estuaries leading into the Sound.

The LWRP identifies the following elements that give vistas importance: visibility of the water; the lack of features that do not fit into the overall scene; the presence of conspicuous foreground, midground, and background features the composition of elements in the view, and the visibility of the scene. (Smithtown LWRP at II-26).

The Town of Smithtown's LWRP follows the 44 coastal policies in the NYS CMP and contains statements of additional policies that are relevant to local conditions.

#### **June 2004 Amendment to the Town of Smithtown LWRP**

In June 2004, the Town of Smithtown submitted an amendment to the NYS DOS to update the 1989 LWRP to reflect local environmental and development conditions, in particular with respect to the former Kings Park Psychiatric Center (KPPC) and to conform the LWRP with the LIS CMP. The LWRP amendment will increase the waterfront area by approximately 80 acres to include the NYSDEC's Nissequogue River Scenic and Recreational Corridor and to include a 50-acre vacant parcel and small commercial parcel adjacent to the former KPPC site.

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<sup>14</sup> The 1989 LWRP follows the State's 44 coastal policies.

#### 4.2.3.1 History of the Town of Smithtown

The waterfront in the Town of Smithtown is characterized by a diversity of high quality visual character types. A large portion of the waterfront is publicly owned. The largest public facilities in the waterfront area include Sunken Meadow State Park, Caleb Smith State Park, and the former KPPC. The shoreline is generally smooth, except for the Sunken Meadow Creek, the Nissequogue River, and Stony Brook Harbor. There are steep escarpments (50-125 feet in height) situated behind coarse sand beaches.

The Town's local economy is not based on its waterfront; the industrial areas are located near important transportation facilities and outside of the waterfront area. Due to environmental constraints, the Town of Smithtown guides development away from the waterfront area.

Waterborne transportation was important to the early economy of Smithtown's waterfront when ships were the dominant mode of transportation. However, due to the lack of a good harbor, Smithtown was less regionally important than Huntington, Northport, and Port Jefferson, which are all located adjacent to deep, well protected harbors.

As modes of transportation and industrial technology evolved, the waterfront lost its commercial and geographic significance. In the 1870's, the Long Island Railroad was extended through Smithtown and a new commercial center developed around the railroad station.

In recent years, there has been a high demand for housing in Long Island which has caused increased pressure for higher density development in Smithtown generally. (June 2004 Draft Amendment to LWRP, at II-30). This has resulted in development pressure in the waterfront area due to the lack of suitable development land outside of the waterfront area. (*Id.*).

The visual quality of the waterfront landscape, consisting of rolling terrain, bluffs, beaches, ponds, streams, the Nissequogue River, Stony Brook Harbor, Sunken Meadow Creek, and Smithtown Bay, is considered a significant resource of the Town. The features are mostly in their natural condition. Most of the vegetation of the waterfront contains tidal wetlands, freshwater marshes, oak forests, abandoned fields, and transitional vegetation. "The fact that Smithtown's waterfront is so heavily wooded is also beneficial to the visual quality because the vegetation obscures many structures that contrast with the natural landscape." (Smithtown LWRP at II-25).

The structural components of the waterfront landscape consist of man-made objects such as buildings, roads, and power lines. Few of these structures have been built along the beaches and few are visible from the water. There are some houses east of Sunken Meadow Park that are outside of the waterfront area and are only visible from the water. However, they "do not seem to be significant, as they are small and scattered elements that are set back one half mile from the shore." (Smithtown LWRP at II-25).

There are a number of significant vistas in the waterfront including the summit on NYS 25A at Sunken Meadow Park, which is considered to be "one of the most important vistas of Long Island Sound from Long Island. The view has a good composition and has a high value foreground, midground, and background features." (Smithtown LWRP at II-25).

#### 4.2.3.2 Policies of the Town of Smithtown LWRP

**POLICY 1:** *Restore, revitalize, and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.*

The Broadwater Project will not utilize any waterfront locations in the Town of Smithtown coastal boundary. As such, this LWRP policy is not applicable to the Broadwater Project. Even assuming however, that this LWRP were applicable, the Broadwater Project is consistent with this LWRP policy. Broadwater completed an analysis of visually sensitive receptors, including the Nissequogue or Sunken Meadow State Parks in Smithtown, which confirms that the FSRU will not be visible from either location. Refer to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O, for additional discussion of Broadwater's onshore facilities.

**POLICY 1A** *Rehabilitate deteriorating residential structures in San Remo and in the vicinity of the Kings Park Bluff.*

The Broadwater Project will not involve any onshore structures, residential or otherwise, in the Town of Smithtown coastal boundary. As such, this LWRP policy is not applicable to the Broadwater Project.

**POLICY 1B** *Redevelop the west end of the Smithtown CBD to a hub of water dependent and water enhanced, low key residential uses with a mix of water enhanced residential and commercial uses.*

The Broadwater Project does not propose any onshore development in the Town of Smithtown coastal boundary. As such, this LWRP policy is not applicable to the Broadwater Project.

**POLICY 1C** *When the Kings Park Psychiatric Center is no longer needed for its original purpose, restore and revitalize the core area of the center for institutional and residential uses and redevelop the periphery of the center for a mix of recreational, conservation and agricultural use.*

The Broadwater Project does not propose any onshore development in the Town of Smithtown coastal boundary, including any development involving the KPPC. As such, this LWRP policy is not applicable to the Broadwater Project.

**POLICY 2:** *Facilitate the siting of water dependent uses and facilities on or adjacent to coastal waters.*

The Broadwater Project is a water dependent use. Broadwater is in the business of serving the target markets with overseas-sourced energy, which requires the transport of LNG to the FSRU for vaporization into natural gas and the delivery of the resulting natural gas to the subsea IGTS pipeline and into the target markets. Refer to Broadwater's response to LIS CMP Policy 10 above for further discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 3:** *The state coastal policy regarding development of major ports is not applicable to the Town of Smithtown.*

As explicitly stated, this LWRP policy does not apply to the Smithtown coastal zone. Refer to State CMP Policy 3 below for further discussion.

**POLICY 4:** *The state coastal policy regarding the strengthening of small harbor areas is not applicable to Smithtown.*

As explicitly stated, this LWRP policy does not apply to the Smithtown coastal zone. Refer to State CMP Policy 4, below for further discussion.

**POLICY 5:** *Encourage the location of development in areas where public services and facilities essential to such development are adequate, except when such development has special functional requirements or other characteristics which necessitates its location in other coastal areas.*

The Broadwater Project does not propose to locate any onshore facilities in Smithtown. Therefore, the Broadwater Project will not require the use of Smithtown's public services and facilities. Because of the distant, offshore location that is proposed for the FSRU and connecting pipeline, this policy does not apply to these offshore facilities. The Broadwater Project, therefore, will be consistent with this LWRP policy.

**POLICY 5A:** *Prevent development of vacant undersized lots in San Remo which, if developed, would pose health and/or safety hazards by reason of location in flood hazard zones, poor drainage, shallow depth to groundwater, poor soil conditions, or inadequate size.*

The Broadwater Project will not involve development of any vacant land in Smithtown. Therefore, this LWRP policy is inapplicable to the Broadwater Project.

**POLICY 5B** *A bridge connecting Long Island and Connecticut shall not be located in the Smithtown waterfront area.*

The Broadwater Project does not propose to build a bridge connecting Long Island and Connecticut in the Smithtown waterfront area. Therefore, this policy is inapplicable to the Broadwater Project.



**POLICY 6:** *Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.*

The Broadwater Project does not propose any onshore locations in Smithtown. Therefore, no permits related to development in Smithtown are required for the Broadwater Project.

**POLICY 7:** *Significant coastal fish and wildlife habitats, as identified on the coastal area map, shall be protected, preserved, and, where practical, restored so as to maintain their viability as habitats.*

The Broadwater Project is consistent with the goals and objectives of this policy because it will protect and preserve coastal fish habitats and living marine resources in the Long Island Sound coastal area. And because no onshore facilities are proposed in Smithtown, the Broadwater Project will preserve existing fish and wildlife habitats in the Smithtown coastal area. Refer to Broadwater's response to LIS CMP Policy 6 above for further discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 7A:** *The Nissequogue River Habitat shall be protected, preserved and restored so as to maintain its viability as a habitat.*

The Nissequogue River Habitat will be preserved with the Broadwater Project because Broadwater does not propose any onshore facilities in Smithtown. Broadwater's distant offshore location for the FSRU and connecting pipeline will also preserve this habitat. Therefore, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 7B:** *The Nissequogue Inlet Beaches Habitat shall be protected, preserved, and managed so as to maintain its viability as habitat for protected nesting shorebirds and terrapin.*

The Nissequogue Inlet Beaches Habitat will be preserved with the Broadwater Project because Broadwater does not propose any onshore facilities in Smithtown. Broadwater's distant offshore location for the FSRU and connecting pipeline will also preserve this habitat. Therefore, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 7C:** *The Stony Brook Harbor Habitat shall be protected, preserved, managed and restored so as to maintain its viability as habitat for shellfish, protected nesting shorebirds, and wintering waterfowl.*

The Stony Brook Harbor Habitat will be preserved with the Broadwater Project because Broadwater does not propose any onshore facilities in Smithtown. Broadwater's distant offshore location for the FSRU and interconnection pipeline will also preserve this habitat. Therefore, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 7D:** *Other locally significant habitats (Fresh Pond, Sunken Meadow Creek, and Head of the River) shall be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

Locally significant habitats will be preserved with the Broadwater Project because Broadwater does not propose any onshore facilities in Smithtown. Broadwater's distant offshore location for the FSRU and interconnection pipeline will also preserve this habitat. Therefore, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 8:** *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bioaccumulate in the food chain or which cause significant sublethal or lethal effect on those resources.*

The Broadwater Project is consistent with this LWRP policy because the fish and wildlife resources in the Smithtown coastal boundary will be protected from hazardous wastes and other pollutants that can bio-accumulate in the food chain or cause significant sublethal or lethal effect on those resources. Broadwater's distant offshore location for the FSRU and interconnection pipeline will preserve this habitat.

Refer to Broadwater's responses to LIS CMP Policies 6 and 8, as well as Greenport LWRP Policy 8 for further discussion of the Broadwater Project's compliance with this policy. See also Section 2.1.2.8.1 regarding the Broadwater Project's waste and waste handling for further discussion and analysis regarding Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 9:** *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks and developing new resources. Such efforts shall be made in a manner which ensures the protection of renewable fish and wildlife resources and considers other activities dependent on them.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy as a result of its Social Investment Program, under which Broadwater will consider establishing a social investment fund or foundation for the funding of regional projects that will benefit the environment and the public alike. Such funding could, among other things, result in increased access to existing fish and wildlife resources in Long Island's coastal areas as well as the development of new or additional resources. A more detailed discussion of Broadwater's Social Investment Program is set forth in Appendix L.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 9A:** *Maintain the supply of shellfish and finfish for recreational fisherman as well as for commercial fishermen through mariculture and shellfish management programs.*

Refer to Broadwater's response to Policy 9 above for a discussion of Broadwater's consistency with this LWRP policy.

**POLICY 10:** *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by: i. encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities; ii. increasing marketing of the State's seafood products; and ii. maintaining adequate stocks and expanding aquaculture facilities. Such efforts shall be in a manner which ensures the protection of such renewable fish resources and considers other activities dependent on them.*

The placement of the FSRU in a distant, offshore location preserves and protects existing marine resources, including finfish, shellfish and crustaceans, in the Town of Smithtown and the Long Island Sound area. Refer to Broadwater's response to LIS CMP Policy 6 above for a discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Broadwater's Essential Fish Habitat Assessment, which is annexed as Appendix G, and Broadwater's Fishermen Outreach Survey, which is annexed as Appendix H, for additional discussion and analysis establishing Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 11:** *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

The Broadwater Project does not propose to locate buildings or structures in the Smithtown coastal area. Therefore, this LWRP policy is inapplicable to the Broadwater Project.

**POLICY 12:** *Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs. Primary dunes will be protected from all encroachments that could impair their natural protective capacity.*

The Broadwater Project does not propose to conduct activities or development in the Smithtown coastal area. Therefore, this LWRP policy is inapplicable to the Broadwater Project.

**POLICY 13:** *The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.*

The Broadwater Project does not propose to conduct activities or development in the Smithtown coastal area, including the construction or reconstruction of erosion protection structures. Refer to Broadwater's response to LIS CMP Policy 4 above for additional discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 14:** *Activities and development, including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.*

The Broadwater Project does not propose to conduct activities or development in the Smithtown coastal area, including the construction or reconstruction of erosion protection structures. Refer to Broadwater's response to LIS CMP Policy 4, and Greenport LWRP Policies 12, 13 & 13A above for a discussion of the Broadwater Project's compliance with this LWRP policy.

**POLICY 14A:** *Undertake erosion control and management techniques for all phases of new development, including construction.*

The Broadwater Project does not propose to conduct activities or development in the Smithtown coastal area, including the construction or reconstruction of erosion protection structures. Refer to Broadwater's response to LIS CMP Policy 4 above for additional discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 15:** *Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.*

The Broadwater Project is consistent with the goals and objectives with this LWRP policy as there will not be mining, excavation or dredging in coastal waters within Smithtown's coastal boundary that could interfere with the natural coastal processes, including those that supply beach materials to land adjacent to such waters. Offshore trenching activities for the purposes of placing the Broadwater interconnecting pipeline will not interfere with the natural coastal processes, including those that are the focus of this policy. Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 16:** *Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.*

The Broadwater Project is privately funded and therefore this LWRP policy is not applicable.

**POLICY 17:** *Whenever possible, use non-structural measures to minimize damage to natural resources and property from flooding and erosion. Such measures shall include: i. the set back of buildings and structures; ii. the planting of vegetation and the installation of sand fencing and draining; iii. the reshaping of bluffs; and iv. the flood-proofing of buildings or their elevation above the base flood level.*

The Broadwater Project does not propose to locate any onshore facility in Smithtown. Therefore, the Broadwater Project will not require construction or other activities that could result in damage to natural resources and property from flooding and erosion in Smithtown.

**POLICY 17A:** *Natural vegetation shall be maintained to the greatest extent practicable, particularly at the bluffs at Old Dock Road Park.*

The Broadwater Project does not propose to locate any onshore facilities in Smithtown. Therefore, the Broadwater Project will maintain all existing natural vegetation, particularly at the bluffs at Old Dock Road Park. Therefore, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 18:** *To safeguard the vital economic, social and environmental interest of the State and of its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the State has established to protect valuable coastal resource areas.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because it has given full consideration to the economic, social, and environmental interests of the State and its citizens and to the safeguards that the State has established to protect valuable coastal resource areas. For example, and without limitation, with respect to such resources in Smithtown, Broadwater has considered certain resources – such as Nissequogue State Park and Sunken Meadow State Park – as part of its coastal zone consistency evaluation, and confirmed that the FSRU will not be visible from these locations. See Table 19, above.

Refer to Broadwater's response to LIS CMP Policy 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, above, for a discussion of the Broadwater Project's compliance with this LWRP policy. See also

Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F, for further confirmation of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 19:** *Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities so that these resources and facilities may be utilized by all the public in accordance with reasonably anticipated public recreation needs and the protection of historic and natural resources. In providing such access, priority shall be given to public beaches, boating facilities, fishing areas and waterfront parks.*

The Broadwater Project will be consistent with this LWRP policy because Broadwater's placement of its onshore facilities in other communities and offshore locations in the central portion of Long Island Sound will be protective and respectful of the level and types of access to public water-related recreation as well as historic and natural resources in the Smithtown coastal area. Refer to Broadwater's response to LIS CMP Policy 9 above for a discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F, and Broadwater's Marine/Land Use Compatibility Assessment, which is annexed as Appendix E, for further confirmation of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 20:** *Access to the publicly owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned shall be provided, and it shall be provided in a manner compatible with adjoining uses. Such lands shall be retained in public ownership.*

The Broadwater Project is consistent with the goals and objectives of this LWRP policy because it will not limit access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned and located in the Smithtown coastal area. Broadwater's water-dependent business support operations will take place in other communities. Refer to Broadwater's response to LIS CMP Policy 9 above for further discussion of the Broadwater Project's compliance with this LWRP policy. *See also* Broadwater's Marine/Land Use Compatibility Assessment, annexed as Appendix E.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 21:** *Water-dependent and water-enhanced recreation shall be encouraged and facilitated and shall be given priority over non-water related uses along the coast, provided it is consistent with the preservation and enhancement of other coastal resources and takes into account demand for such facilities. In facilitating such activities, priority shall be given to areas where access to the recreation opportunities of the coast can be provided by new or existing public transportation services and to those areas where the use of the shore is severely restricted by existing development.*

The Broadwater Project does not propose onshore locations in Smithtown and thus there will be no competition for waterfront property along the coast. Refer to Broadwater's response to LIS CMP Policies 9 and 10 above for a discussion of the issues raised by this LWRP policy.

**POLICY 21A:** *The size and speed of boats shall be restricted in the environmentally sensitive sections of Stony Brook Harbor, the Nissequogue River, and Sunken Meadow Creek.*

The Broadwater Project does not propose to use speed boats anywhere in the Smithtown coastal area. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 22:** *Development, when located adjacent to the shore, shall provide for water-related recreation, as a multiple use, whenever such recreational use is appropriate in light of reasonably anticipated demand for such activities and the primary purpose of the development.*

The Broadwater Project does not propose any development within the Smithtown coastal area. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 23:** *Protect, enhance and restore structures, districts, areas or sites that are of significance on the history, architecture, archaeology or culture of the State, its communities, or the nation.*

The Broadwater Project is consistent with this policy because it does not propose any onshore facilities in Smithtown. In addition, by siting the FSRU in a distant, offshore location, the Broadwater Project is respectful and protective of existing structures, districts, areas, or sites that are of significance to the history, architecture, archaeology and culture of the State, its communities, and the nation. For additional discussion regarding existing site conditions pertaining to historic, archaeologic, and cultural resources, refer to Existing Site Conditions, Chapter 3.4.2, above. Refer also to LIS CMP Policy 2 above and to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.



**POLICY 23A:** *Protect, restore, and rehabilitate locally significant historic sites in Sunken Meadow State Park, Caleb Smith State Park, and the Kings Park Psychiatric Center.*

The Broadwater Project is consistent with this LWRP policy because it does not propose any onshore facilities in Smithtown. In addition, by siting the FSRU in a distant, offshore location, the Broadwater Project is respectful and protective of locally significant historic sites, such as those in Sunken Meadow State Park, Caleb Smith State Park, and the Kings Park Psychiatric Center. For example, Broadwater is protective of Sunken Meadow State Park because the FSRU will not be visible from the park, as established Broadwater's VRA. For additional discussion regarding locally significant historic sites, refer to Existing Site Conditions, Chapter 3.4.2, above. Refer also to LIS CMP Policy 2, and Broadwater's VRA, which is attached as Appendix K.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 24:** *The state coastal policy regarding scenic resources of statewide significance is not applicable to the Town of Smithtown.*

As explicitly stated, this LWRP policy does not apply to the Smithtown coastal zone. Refer to State CMP Policy 24 for further discussion.

**POLICY 25:** *Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.*

The Broadwater Project is consistent with this LWRP policy because Broadwater's proposed FSRU and onshore locations are respectful of the natural and man-made resources in the Long Island Sound coastal area, including Smithtown, that are not identified as being of statewide significance but that contribute to the overall scenic quality of the area. For additional discussion regarding the Broadwater Project's consistency with this policy, refer to Broadwater's responses to LIS CMP Policies 1, 3, 9, above. See also Existing Conditions Section 3.6.4, above. Refer also to Broadwater's Land/Marine Use Conflict Assessment and Long Island Sound Use Patterns and Trends Analysis, which are annexed as Appendix E and Appendix N, and Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 25A:** *Protect, restore, and enhance the natural visual character of the Nissequogue River and adjacent areas as the river system is a locally significant scenic and recreational resource.*

The Broadwater Project is consistent with this LWRP policy because it protects the natural visual character of the Nissequogue River and adjacent areas. The Broadwater Project does not propose onshore facilities in Smithtown. The offshore location of the FSRU – which is more than 24 miles from Nissequogue State Park – will not be visible from the park.

Refer to Broadwater's responses to LIS CMP Policies 1 and 3 for additional discussion regarding issues raised by this policy. For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 25B:** *Prevent the irreversible modification of natural geological forms and the removal of vegetation from dunes, bluffs and wetland areas which are significant to the scenic areas of the Town of Smithtown.*

The Broadwater Project does not propose onshore facilities or other activities in the Smithtown coastal area. As such, the Broadwater Project will not result in irreversible modification of natural geological forms or the removal of natural vegetation that are significant to the scenic areas of Smithtown. Refer also to Broadwater's responses to Smithtown LWRP Policies 25 and 25A, above.

For all these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 25C:** *Protect the visual quality and enhance access to scenic overlooks in Sunken Meadow State Park and the Kings Park Psychiatric Center.*

The Broadwater Project is consistent with this policy because it is protective of the visual quality in the Smithtown coastal area. For example, Broadwater is protective of Sunken Meadow State Park because the FSRU will not be visible from the KPPC, as established Broadwater's VRA. (See Table 8, VP# LI49). Refer also to Broadwater's response to LIS CMP Policy 3 for additional discussion regarding Broadwater's consistency with the objectives of this policy.

For all these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 25D:** *Enhance the visual quality of the Smithtown CBD to make the area more compatible with the Nissequogue River.*

The Broadwater Project does not propose any onshore facilities in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 26:** *To conserve and protect the agricultural lands in the State's coastal area, an action shall not result in the loss, nor impair the productivity of important agricultural lands, as identified on the coastal area map, if that loss would adversely effect the viability of agriculture in an agricultural district or if there is no agricultural district, in the area surrounding such lands.*

The Broadwater Project does not propose any onshore facilities in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 26A:** *Encourage the retention of the remaining land actively used for agriculture in the Hamlet of Smithtown and prime agricultural soils in the Kings Park Psychiatric Center.*

The Broadwater Project does not propose any onshore facilities in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 27:** *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment, and the facility's need for a shorefront location.*

The Broadwater Project is consistent with this LWRP policy because the LNG terminal and interconnection pipeline will not be sited or constructed on the shorefront of Smithtown. Additionally, the location of Broadwater's FSRU and interconnection pipeline are appropriate uses of the Long Island Sound coastal area. For additional discussion regarding the Broadwater Project's consistency with this LWRP policy, refer to Broadwater's responses to LIS CMP Policies 1, 10, and 13, above. Refer also to Broadwater's Land/Marine Use Conflict Assessment and Long Island Sound's Use Patterns and Trends Analysis, which are annexed as Appendix E, and Appendix N, and Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 28:** *The state coastal policy regarding ice management is not applicable to the Town of Smithtown.*

As explicitly stated, this LWRP policy does not apply to the Smithtown coastal area. Refer to State CMP Policy 28 for further discussion.

**POLICY 29:** *Encourage the development of energy resources on the outer continental shelf, in Lake Erie and in other water bodies, and ensure the environmental safety of such activities.*

The Broadwater Project is consistent with this LWRP policy because it will introduce a new supply of natural gas into the target markets, using the abundant and vast waters of Long Island Sound. Broadwater's selected location for its LNG terminal and interconnection pipeline in the central portion of Long Island Sound avoids safety issues that would otherwise be relevant to an onshore LNG facility. Here, the nearest coastal community will be a minimum of 9 miles from the FSRU. The Broadwater Project is also protective of and is taking multiple measures to protect the natural resources of Long Island Sound. Additional discussion regarding the Broadwater Project's consistency with this policy is set forth in Broadwater's responses to LIS CMP Policies 1, 5, 8, and 13, above. Refer also to Broadwater's reports on Water and Sediment Quality and Air Quality, which are annexed as Appendix A and Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 30:** *Municipal, industrial, and commercial discharge of pollutants including, but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.*

The Broadwater Project is consistent with this LWRP policy because Broadwater will comply with state and national water quality standards that are applicable to the Broadwater Project. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 5. Refer also to Broadwater's report on Water and Sediment Quality, annexed as Appendix A. See also Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 30A:** *Uses likely to result in the discharge of toxic and hazardous substances are not permitted in the waterfront area.*

The Broadwater Project does not propose any onshore facilities in the waterfront area of Smithtown. Therefore, the Broadwater Project will not result in the discharge of toxic and hazardous substances into the Smithtown waterfront area. Refer to Broadwater's response to Smithtown LWRP Policy 30 above for additional discussion regarding the issues raised by this policy.

**POLICY 31:** *State coastal area policies and purposes of approved local waterfront revitalization programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already overburdened with contaminants will be recognized as being a development constraint.*

Given that the Broadwater Project will not involve review or modification of coastal water classifications or water quality standards, this LWRP policy is not applicable.

**POLICY 32:** *Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high given the size of the existing tax base of these communities.*

The Broadwater Project does not propose to site onshore facilities in Smithtown and therefore this policy is not applicable. Refer to LIS CMP Policy 8 above for discussion regarding Broadwater's waste handling procedures.

**POLICY 33:** *Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.*

The Broadwater Project does not propose to locate its onshore facilities in Smithtown. Therefore, this policy is not applicable. Refer to Broadwater's responses to LIS CMP Policies 5 and 8 above for discussion of stormwater runoff and sewage management practice for Broadwater's on and offshore facilities. Refer also to Broadwater's report on Water

and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

**POLICY 34:** *Discharge of waste materials from vessels into coastal waters will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.*

The Broadwater Project is consistent with this policy because Broadwater will operate in a manner that is protective of significant fish and wildlife habitats and recreational areas. The Broadwater Project is not anticipated to impact water supply areas within the Long Island Sound coastal region.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5, 6, and 8. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 35:** *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

This LWRP policy arguably applies only to the waters within the coastal boundary of Smithtown. The Broadwater Project does not propose any onshore facilities in Smithtown, thereby eliminating the need for dredging in the coastal area. Because the FSRU and interconnecting pipeline will be sited outside of the Smithtown coastal boundary in a distant, offshore location, the Broadwater Project eliminates the need for dredging that would likely be necessary to accommodate the draft of LNG carriers servicing an onshore LNG terminal.

Additional analysis and discussion regarding issues raised by this LWRP policy is set forth in the Project Description set forth in Chapter 2, Section 2.2 *et seq.*, above. *See also* Broadwater's Onshore Facilities Resource Reports, section 1.2 at 1-6, annexed as Appendix O.

**POLICY 35A:** *Dredging to realign channels may be undertaken in the Nissequogue River and Stony Brook Harbor mouth solely if actions will result in less maintenance and minimal impact on environmental resources.*

See Broadwater's response to Smithtown LWRP Policy 35, above.

**POLICY 35B:** *Wetland channels may be realigned only if said action results in enhancing the viability of the wetland area.*

See Broadwater's response to Smithtown LWRP Policy 35, above.

**POLICY 36:** *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

This LWRP policy arguably applies only to the Smithtown coastal boundary. Because Broadwater proposes no onshore facilities for Smithtown and no shipment or storage of petroleum or other hazardous materials in the Smithtown coastal area, Broadwater avoids concerns regarding the protection of Smithtown's coastal waters from spills. Additional analysis of Broadwater's consideration of issues raised by this policy is set forth in Broadwater's response to LIS CMP Policy 8.

**POLICY 36A:** *Non-water dependent uses related to the storage and/or transport of petroleum and oil such as gas stations, fuel oil companies, and chemical storage companies, will be gradually eliminated from the local waterfront area.*

The Broadwater Project does not propose any onshore facilities in Smithtown, including any related to the storage and/or transport of petroleum and oil. Therefore, this LWRP policy is inapplicable to the Broadwater Project.

**POLICY 37:** *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.*

Because there are no onshore facilities proposed for Smithtown, this policy is inapplicable to the Broadwater Project.

**POLICY 37A:** *New development shall not result in greater than zero percent additional stormwater run-off.*

The Broadwater Project does not propose any development in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 38:** *The quality and quantity of surface water and groundwater supplies, will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.*

The Broadwater Project does not propose any onshore facilities in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 38A:** *Uses and/or development which may adversely impact ground and surface waters shall not be permitted in the coastal area.*

The Broadwater Project does not propose any development in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 38B:** *Residential densities for new development will be low unless utilities are provided to protect residents' health and water supply.*

The Broadwater Project does not propose any residential development in Smithtown. Therefore, this policy is inapplicable to the Broadwater Project.

**POLICY 39:** *The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural lands and scenic resources.*

The Broadwater Project does not propose any transport, storage, treatment or disposal of solid or hazardous wastes within the Smithtown coastal boundary. Therefore, this policy is inapplicable to the Broadwater Project. Refer to Broadwater's responses to LIS CMP Policy 8 above for discussion regarding issues raised by this LWRP policy.

**POLICY 39A:** *The existing ash fill at the Kings Park Psychiatric Center shall not be expanded.*

The Broadwater Project does not propose to expand the existing ash fill at KPPC.

**POLICY 40:** *Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.*

The Broadwater Project will be consistent with this policy, for reasons more fully set forth in Broadwater's response to LIS CMP Policy 5, above.

**POLICY 41:** *Land use or development in the coastal area will not cause national or state air quality standards to be violated nitrates and sulfates [sic].*

Broadwater does not propose land use or development in the Smithtown coastal area. And the Broadwater Project will not cause national or state air quality standards to be violated within the Long Island Sound region, including Smithtown. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's report addressing Air Quality, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 42:** *Coastal management policies will be considered if the State reclassifies land areas pursuant to the Prevention of Significant Deterioration regulations of the Federal Clean Air Act.*

The Broadwater Project will not involve reclassifying land areas pursuant to the PSD regulations of the Federal Clean Air Act. This policy, therefore, will not be applicable to the Broadwater Project.



**POLICY 43:** *Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.*

The Broadwater Project is consistent with this LWRP policy because it will not result in the generation of significant amounts of acid rain precursors nitrates and sulfates.

Additional analysis and discussion confirming the Broadwater Project's consistency with this LWRP policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's report addressing Air Quality Appendix, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 44:** *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

The Broadwater Project will preserve tidal and freshwater wetlands and preserve the benefits derived from these areas because the Broadwater Project does not propose any onshore facilities that would impact such wetlands and the distant, offshore location of the FSRU and interconnection pipeline avoids any impacts to such wetlands. Refer to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O, for additional discussion regarding wetlands.

**POLICY 44A:** *The construction of docks and piers in the Nissequogue River is limited to existing channels and access points to existing yacht clubs.*

The Broadwater Project does not propose the construction of docks or piers in the Nissequogue River. Therefore, this LWRP policy is inapplicable to the Broadwater Project.

### **4.3 Port Jefferson Harbor Complex Harbor Management Plan**

#### **4.3.1 Harbor Issues and Recommendations**

**HARBOR OBJECTIVE #1** *Enhance the commercial waterfront area of lower Port Jefferson Harbor*

**ISSUE 1:** *Public access along the Port Jefferson Village waterfront need to be improved and increased.*

**ISSUE 2:** *Parking and traffic circulation in downtown Port Jefferson Village needs to be improved.*

**ISSUE 3:** *There is no formal municipal presence in the Harbor Complex to orient and inform recreational boaters.*

**ISSUE 4:** *The financing of capital improvements along the Port Jefferson Village waterfront should be prioritized.*

**ISSUE 5:** *The historical significant of lower Port Jefferson Harbor has not been comprehensively assessed.*

The Broadwater Project will be consistent with the goals identified as part of Harbor Objective #1 because the proposed onshore business support facilities that are proposed for Port Jefferson's waterfront area are consistent with the historic and existing mixed uses of the commercial waterfront area and will continue to be used for water-dependent commerce in Long Island Sound. Significantly, the Broadwater Project's onshore facilities in the waterfront area will not impact public access to the Port Jefferson Village waterfront. Broadwater's Port Jefferson waterfront operations will serve the primary, water-dependent purpose of facilitating Broadwater's business by transporting personnel and materials to the FSRU.

Further discussion of Broadwater's proposed onshore facilities in the Village of Port Jefferson is contained in Broadwater's Onshore Facilities Resource Reports, at page 1-7, annexed as Appendix O. Refer also to Broadwater's discussion regarding the applicable zoning and land use patterns and trends analysis, as more fully set forth in section 3.6 and in the Long Island Sound Use Patterns and Trends Analysis, which is annexed as Appendix N, and Broadwater's response to LIS CMP Policies 1, 9, and 10, above.

For all these reasons, the Broadwater Project is consistent with Objective #1 of the Port Jefferson HMP.

**HARBOR OBJECTIVE #2** *Improve Operating Conditions for Water Dependent Recreational, Commercial, and Industrial Uses*

**ISSUE 1:** *Water-dependent uses need to be given priority consideration due to their unique siting requirements and the limited amount of waterfront property that is suitable and available to them.*

**ISSUE 2:** *Commercial fishing support facilities are insufficient and can be improved.*

**ISSUE 3:** *Obtaining permits to dredge is often difficult and time consuming.*

The Broadwater Project will be consistent with the goals identified as part of Harbor Objective #2 because the onshore business support facilities that are proposed for Port Jefferson's waterfront area will enable Broadwater to complete activities that are fundamental to the successful operation of Broadwater's water-dependent business. Importantly, Broadwater's lease of existing buildings and locations will avoid additional competition for the already pressured and limited open space that remains along Port Jefferson's waterfront, which can be used for other water-dependent recreational commercial purposes, including, among others, commercial fishing.

Further discussion of the water-dependency of Broadwater's proposed onshore facilities in the Village of Port Jefferson is contained in Broadwater's Onshore Facilities Resource Reports, pages 1-1 to 1-7, annexed as Appendix O. Refer also to Broadwater's response to LIS CMP Policies 1, 9, and 10 above and to Broadwater's discussion regarding the

applicable zoning and land use patterns and trends in Port Jefferson, as more fully set forth in the Long Island Sound Use Patterns and Trends Analysis at 18, which is annexed as Appendix N.

For all these reasons, the Broadwater Project is consistent with Objective #2 of the Port Jefferson HMP.

**HARBOR OBJECTIVE #3**     *Ensure Public and Vessel Safety, and Improve Conditions for Navigation for All Harbor Users*

- ISSUE 1:**     *Vessel activities need to be regulated to protect public safety and to minimize user conflicts.*
- ISSUE 2:**     *The perimeters of mooring fields and anchorage areas have not been designated in Port Jefferson Harbor and in Setauket Harbor.*
- ISSUE 3:**     *There are a number of surface water use conflicts which can be minimized by identifying surface water use areas for certain activities.*
- ISSUE 4:**     *Navigation lanes are not well defined or marked.*
- ISSUE 5:**     *Improperly designed and sited residential docks can impair navigation and threaten public safety.*
- ISSUE 6:**     *There is a need to provide information and assistance to boaters and to provide oversight and enforcement of regulations.*

The Broadwater Project will be consistent with the goals identified as part of Harbor Objective #3 because Broadwater's use of proposed onshore locations in Port Jefferson will be conducted in compliance with all local rules and standard navigational practices to ensure the safety of other vessels and the public.

The use of the proposed waterfront locations in Port Jefferson will facilitate activities that are fundamental to the successful operation of Broadwater's water-dependent business. Importantly, Broadwater's lease of existing buildings and locations in the Port Jefferson area will not result in additional competition for limited, open space along Port Jefferson's waterfront that can be used for recreational purposes or other water-dependent uses.

Further discussion of the water-dependency of Broadwater's proposed onshore facilities in the Village of Port Jefferson is contained in Broadwater's Onshore Facilities Resource Reports, pages 1-1 to 1-7, annexed as Appendix O. Refer also to Broadwater's response to LIS CMP Policies 1, 9, and 10 above and to Broadwater's discussion regarding the applicable zoning and land use patterns and trends in Port Jefferson, as more fully set forth in the Long Island Sound Use Patterns and Trends Analysis, which is annexed as Appendix N.

For all these reasons, the Broadwater Project is consistent with Objective #3 of the Port Jefferson HMP.

**HARBOR OBJECTIVE #4** *Protect and Enhance Environmental Conditions*

**WATER QUALITY ISSUES**

**ISSUE 1:** *Water quality in the Harbor Complex is degraded but can be improved.*

**ENVIRONMENTAL AND ECOLOGICAL ISSUES**

**ISSUE 1:** *The construction, design, and location of residential docks has the potential to adversely impact natural resources and public access.*

**ISSUE 2:** *Shoreline hardening structures (such as seawalls, jetties, groins, revetments) can adversely impact natural resources and may cause scouring of the area seaward and or adjacent to the structure.*

**ISSUE 3:** *Site specific management plans are needed to protect natural resources which are at risk.*

**ISSUE 4:** *Maintaining low residential development densities and large areas of undeveloped public open space in the surrounding upland area can help to protect natural resources and water quality.*

The Broadwater Project will be consistent with the goals identified in Objective #4 because it is protective and respectful of environmental conditions in the Port Jefferson harbor area, including water quality and natural resources.

*Water Quality Issues*

The Broadwater Project recognizes the existence of sensitive water bodies, including Port Jefferson Harbor and Peconic Bay, in the proximity of the proposed onshore facilities in Port Jefferson. The operation of Broadwater's onshore business support operations, including the vessel transport of materials and personnel to the FSRU, will not degrade the quality of the water in the Port Jefferson Harbor area.

Further discussion regarding water quality around Port Jefferson Harbor with Broadwater's proposed onshore facilities in the Village of Port Jefferson is contained in Broadwater's Onshore Facilities Resource Reports, Chapter 2, annexed as part of Appendix O. Refer also to Broadwater's response to LIS CMP Policy 5 above and to Broadwater's report regarding water quality as set forth in Appendix A, for additional discussion regarding Broadwater's compliance with this Objective.

*Environmental and Ecological Issues*

Broadwater will lease existing onshore facilities for onshore operations in the Village of Port Jefferson and does not anticipate constructing residential docks or shoreline hardening structures. Broadwater proposes no construction activities at the Port Jefferson location except for the installation of security fencing and a security check-point at the facility entrance which is not expected to result in impacts on fish, vegetation, or wildlife. Broadwater has considered the fish, vegetation and wildlife that are in the vicinity of the proposed Port

Jefferson location. Broadwater's analysis of these resources is set forth in the Onshore Facilities Resource Reports, Chapter 3, annexed as part of Appendix O.

Broadwater's use of existing locations in the Village of Port Jefferson will preserve public open space to protect natural resources and water quality.

For all these reasons, the Broadwater Project is consistent with Objective #4 of the Port Jefferson HMP.

#### **4.4 Policies of the New York State Coastal Management Program**

**POLICY 1**      *Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.*

The Broadwater Project is consistent with the goals and objectives of this policy because the use of existing facilities for onshore requirements in either of the proposed locations in the Village of Greenport or the Village of Port Jefferson will maintain existing, compatible uses that are an important part of each respective community's character. Refer to Broadwater's response to LIS CMP Policy 1 above for further discussion of the Broadwater Project's compliance with this policy. Refer also to Broadwater's Long Island Sound Use Patterns and Trends Analysis, which is annexed as Appendix N.

**POLICY 2**      *Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.*

The Broadwater Project is consistent with the objectives and goals of this policy because Broadwater's business of serving the target markets with overseas-sourced energy, which requires the transport of LNG to the FSRU for vaporization into natural gas and the delivery of the resulting natural gas to the subsea IGTS pipeline and into the target markets, is water-dependent. In addition, Broadwater's onshore business support facilities that are proposed for the waterfronts in the Village of Greenport and the Village of Port Jefferson will be for the purpose of mooring tugs and enabling the transfer of materials and personnel to the FSRU. Refer to Broadwater's responses to LIS CMP Policy 10 above and Greenport LWRP Policy \_\_\_ for further discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 3** *Further develop the State's major ports of Albany, Buffalo, New York, Ogdensburg and Oswego as centers of commerce and industry, and encourage the siting, in these port areas, including those under the jurisdiction of State public authorities, of land use and development which is essential to, or in support of, the waterborne transportation of cargo and people.*

The Broadwater Project will not be located within any of the State's major ports (NYSDOS Policy 3 Explanation of Policy: stating that "aim of this policy is to support port development in New York, Buffalo, Ogdensburg, and Oswego"); therefore, this policy is not applicable to the Broadwater Project.

**POLICY 4** *Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those traditional uses and activities, which have provided such areas with their unique maritime identity.*

Refer to Broadwater's response to LIS CMP Policy 1 above Economic Impact Analysis -- and also to its Commercial Fisheries, Recreation, and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, annexed as Appendix F, for further discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 5** *Encourage the location of development in areas where public services and facilities essential to such development are adequate, except when such development has special functional requirements or other characteristics which necessitates its location in other coastal areas.*

The Broadwater Project will be consistent with this policy because the proposed onshore facilities are not anticipated to have unusual or special functional requirements. The existing public services in the Villages of Greenport and Port Jefferson will be adequate to support Broadwater's onshore facilities, if any, that are located there. Broadwater will coordinate with emergency services and other public service departments as necessary to ensure adequate communication regarding Broadwater's onshore business operations. Because of the distant, offshore location that is proposed for the FSRU and interconnecting pipeline, this policy does not apply to these offshore facilities. The Broadwater Project, therefore, will be consistent with this policy, which encourages development "to locate within, contiguous to, or in close proximity to, existing areas of concentrated development where infrastructure and public services are adequate." (NYSDOS Policy 5 Explanation of Policy). For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 6** *Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.*

Since existing onshore facility use will be consistent with current uses, Broadwater does not anticipate that any permits will be required specific to the onshore facilities. See Broadwater's Onshore Facilities Resource Reports, Section 1.6 at 1-7, annexed as Appendix O.

**POLICY 7**      *Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.*

The Broadwater Project is consistent with the goals and objectives of this policy because it will protect and preserve coastal fish habitats and living marine resources in the coastal area. Refer to Broadwater's response to LIS CMP Policy 6 above for further discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 8**      *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sub-lethal or lethal effect on those resources.*

The Broadwater Project is consistent with the goals and objectives of this policy because it will protect marine and living resources in the coastal area from the introduction of hazardous wastes and other pollutants that can bio-accumulate in the food chain or cause significant sublethal or lethal effect on those resources.

Refer to Broadwater's responses to LIS CMP Policies 6 and 8 as well as Greenport LWRP Policy 8 for further discussion of the Broadwater Project's compliance with this policy. *See also* Section 2.1.2.8.1 regarding the Broadwater Project's waste and waste handling for further discussion and analysis regarding Broadwater's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 9**      *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources. Such efforts shall be made in a manner which ensures the protection of renewable fish and wildlife resources and considers other activities dependent on them.*

The Broadwater Project is consistent with the goals and objectives of this policy. Broadwater's Social Investment Program will consider establishing a social investment fund or foundation for the funding of regional projects that will benefit the environment and the public alike. Such funding could result in, among other things, increased access to existing fish and wildlife resources in Long Island's coastal areas, as well as new or additional resources. A more detailed discussion of Broadwater's Social Investment Program is set forth in Appendix L.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.



**POLICY 10** *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities, increasing marketing of the state's seafood products, and maintaining adequate stocks, and expanding aquaculture facilities. Such efforts shall be in a manner that ensures the protection of such renewable fish resources and considers other activities dependent on them.*

The Broadwater Project is consistent with this policy to the extent that the placement of the FSRU in a distant, offshore location preserves and protects existing marine resources, including finfish, shellfish and crustaceans, in the Long Island Sound area.

Refer to Broadwater's response to LIS CMP Policy 6 above for a discussion of the Broadwater Project's compliance with this policy. *See also* Broadwater's Essential Fish Habitat Assessment, which is annexed as Appendix G, and Broadwater's Fishermen Outreach Survey, which is annexed as Appendix H, for additional discussion and analysis establishing Broadwater's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 11** *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this policy.

**POLICY 12** *Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs. Primary dunes will be protected from all encroachments that could impair their natural protective capacity.*

Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this policy.

**POLICY 13** *The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.*

Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this policy.

**POLICY 14** *Activities and development, including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.*

Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this policy.

**POLICY 15** *Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.*

There will be no mining, excavation, dredging or trenching that will significantly interfere with the natural coastal processes that supply beach materials to land adjacent to such waters or result in increased erosion. There is also no dredging expected to occur at the proposed onshore locations to accommodate Broadwater tugs that would interfere with natural coastal processes for near shore locations. The trenching that is required for the construction of the interconnection pipeline will similarly not interfere with natural coastal processes that supply beach materials to land adjacent to such waters. Refer to Broadwater's response to LIS CMP Policy 4 above for a discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 16** *Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long-term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.*

The Broadwater Project will not involve the use of public funds for erosion protective structures; therefore, this policy is not applicable to the Broadwater Project.

**POLICY 17** *Nonstructural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.*

The Broadwater Project is consistent with the goals and objectives of this policy because Broadwater's use of existing buildings for its onshore locations will make use of in-place infrastructure that is unlikely to be subject to flooding and erosion due to the elevation of such buildings above the base flood level. In addition, there is unlikely to be any major construction at the proposed onshore locations. Construction that does occur, if any, will take place on previously disturbed land. It is unlikely that there will be a need to alter the physical location of the primary structures of Broadwater's onshore facilities.

In the event that Broadwater's onshore facilities may be exposed to flooding and erosion, however, Broadwater will, when possible, use non-structural measures to minimize

damage to natural resources and property from flooding and erosion, including the use of vegetation and sand fencing and draining. Refer also to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O. For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 18** *To safeguard the vital economic, social and environmental interests of the State, and of its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the State has established to protect valuable coastal resource areas.*

The Broadwater Project is consistent with the goals and objectives of this policy because it has given full consideration to the economic, social, and environmental interests of the state and its citizens and to the safeguards that the State has established to protect valuable coastal resource areas. Refer to Broadwater's response to LIS CMP Policies 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, and 13 above for a discussion of the Broadwater Project's compliance with this policy. *See also* Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F, for further confirmation of Broadwater's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 19** *Protect, maintain, and increase the level and types of access to public water related recreation resources and facilities.*

The Broadwater Project will be consistent with this policy as it will be protective and respectful of the level and types of access to public water-related recreation as well as historic and natural resources. Refer to Broadwater's response to LIS CMP Policy 9 above for a discussion of the Broadwater Project's compliance with this policy. *See also* Commercial Fishing, Recreation and Long Island Sound Dependent Commercial Activities -- An Economic Analysis, which is annexed as Appendix F, and Broadwater's Marine/Land Use Compatibility Assessment, which is annexed as Appendix E, for further confirmation of Broadwater's compliance with this LWRP policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 20** *Access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.*

The Broadwater Project will be consistent with the goals and objectives of this policy because it will not limit access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned. Broadwater's water-dependent business support operations that take place in the Villages of Greenport or Port Jefferson will be consistent with existing waterfront uses in those locations.

Refer to Broadwater's response to LIS CMP Policy 9 above for further discussion of the Broadwater Project's compliance with this policy. *See also* Broadwater's Marine/Land Use Compatibility Assessment, which is annexed as Appendix E.

**POLICY 21** *Water-dependent and water-enhanced recreation will be encouraged and facilitated, and will be given priority over non-water related uses along the coast.*

The Broadwater Project is consistent with this policy because Broadwater's onshore business support operations that will be located in waterfront locations in Greenport or Port Jefferson will be water-dependent, including the mooring of tugs and FSRU support vessels that will transport people and cargo between the shore and the FSRU.

Refer to Broadwater's response to LIS CMP Policies 9 and 10 above for a discussion of the Broadwater Project's compliance with this policy. Refer also to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this LWRP policy.

**POLICY 22** *Development, when located adjacent to the shore, will provide for water related recreation, whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.*

The Broadwater Project will lease property for its proposed onshore business support facilities on Greenport's or Port Jefferson's waterfront to serve the primary purpose of providing marine transfer of people, equipment, and FSRU support vessels. Because the primary purpose of these onshore facilities will be part of the existing working waterfront, it is unlikely that Broadwater's operations on these leased properties will provide for water-related recreation at such locations. Water-related recreation may be provided elsewhere in the Long Island Sound coastal area, including, Port Jefferson and Greenport, as part of Broadwater's Social Investment Program.

Refer to Broadwater's response to LIS CMP Policy 10 above for a discussion of the Broadwater Project's compliance with this policy. Refer also to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 23** *Protect, enhance and restore structures, districts, areas or sites that are of significance in history, architecture, archaeology or culture of the state, its communities, or the nation.*

The Broadwater Project is consistent with this policy because its proposed location for onshore business support facilities in Greenport does not contain resources listed or eligible for listing in the NRHP or known archaeological sites. Two sites listed on the NRHP –

the Greenport Railroad Station and the Greenport Village Historic District – are directly adjacent to the proposed location from the north and west, respectively. Similarly, the proposed onshore location in Port Jefferson does not contain resources listed or eligible for listing in the NRHP or known archaeological sites. Two sites listed on the NRHP – Bayles Shipyard (99NR01545) and the Port Jefferson Village Historic District (02NR04918) – are located immediately east and southeast of the Port Jefferson location.

For additional discussion regarding the existing site conditions pertaining to historic, archaeologic, and cultural resources, refer to Existing Site Conditions, Chapter 3.4.2, above. Refer also to LIS CMP Policy 2, above and to Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 24**     *Prevent impairment of scenic resources of statewide significance.*

There are no areas that have been designated scenic areas of statewide significance (SASS) as defined in Article 42 of the Executive Law in Long Island Sound or the vicinity of the Broadwater Project. Broadwater completed a VRA, which evaluated multiple potentially sensitive visual receptors in the vicinity of the Broadwater Project. The VRA is annexed as Appendix K. Additional discussion regarding Broadwater's inventory of potentially sensitive receptors is set forth in Broadwater's response to LIS CMP Policy 3.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 25**     *Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance but which contribute to the overall scenic quality of the coastal area.*

There are no areas that have been designated SASS as defined in Article 42 of the Executive Law in Long Island Sound or in the vicinity of the Broadwater Project. Broadwater completed a VRA, which evaluated multiple potentially sensitive visual receptors -- including those not identified as SASSs but that contribute to the overall scenic quality of the coastal area - in the vicinity of the Broadwater Project. The VRA is annexed as Appendix K. Broadwater's VRA establishes that the Broadwater Project is respectful of natural and man-made resources that contribute to the overall scenic quality of New York's coastal area.

By way of example and without limitation, Broadwater considered the potentially sensitive visual resources and vantage points within the Town of Riverhead as part of its recently-completed VRA. (See VRA, Appendix K). In fact, Broadwater evaluated the visibility of the FSRU from 13 potentially visually sensitive receptors in the Town of Riverhead. All the shoreline receptors in the Town of Riverhead will view the FSRU within the far background distance zone within the range of 14.9 miles from the FSRU at Future Jamesport State Park to 9.1 miles from the FSRU at the Creek Boat Ramp (VP# 12B and LI23, respectively). While the FSRU may be visible at times from these receptors in the Town of Riverhead, its visibility will be limited largely as a result of its offshore location; at these distances, elements will lose detail

and become less distinct. Broadwater compiled photo simulations from multiple potentially sensitive receptor locations that depict the existing condition (i.e., without the Broadwater Project) and the proposed condition (i.e., with the Broadwater Project). These photo simulations are included as part of Broadwater's VRA. In particular, Broadwater completed photo simulations for Iron Pier Beach (14.3 miles from FSRU) (*see* Appendix K, Figures A-6A, A-6B, A-6C, A-6D, A-6E, A-6F (VP-LI3); Roanoke Avenue Beach (11.1 miles from FSRU) (Appendix K, Figures A-7A, A-7B, A-7C (VP-LI14); Wildwood State Park – Trail Overlook (9.5 miles from FSRU) (Appendix K, Figures A-8A, A-8B, A-8C (VP-LI20); and Wading River Beach (9.2 miles from FSRU) (*see* Appendix K, Figures A-9A, A-9B, A-9C, A-9D, A-9E, A-9F (VP-LI22). These photo simulations confirm that the Broadwater Project will be consistent with features that already exist in Riverhead's view shed and will not create an unusually discordant feature on the Sound. When visible, the Broadwater Project will generally appear as a small two-dimensional rectilinear form on the horizon from the distant coastal vantage points in the Town of Riverhead. While the outline of the Broadwater Project will break the visible horizon from the distant coastal vantage points in the Town, the FSRU will appear quite low and, as distance increases, increasingly more difficult to distinguish from the horizon.

As part of its VRA, Broadwater also considered the potentially sensitive visual resources and vantage points within the Town of Brookhaven. (*See* VRA, Appendix K). In fact, Broadwater evaluated the potential visibility of the FSRU from 21 potentially visually sensitive receptors in the Town of Brookhaven. The FSRU will not be visible from thirteen of these receptors. In addition, while the FSRU may be visible from other receptors in the Town of Brookhaven, its visibility is limited largely as a result of its offshore location. For those shoreline receptors in the Town of Brookhaven that will view the FSRU within the far background distance zone, the FSRU will be between the range of 13.8 miles from the Mt. Sinai Historic District to 9.6 miles from Shoreham Beach. At these distances, elements will lose detail and become less distinct. Broadwater has compiled photo simulations from multiple potentially sensitive receptor locations that depict the existing condition (i.e., without the Broadwater Project) and the proposed condition (i.e., with the Broadwater Project). These photo simulations are included as part of Broadwater's VRA. In particular, Broadwater completed photo simulations for Shoreham Beach (*see* Appendix K, Figures A-10A, A-10B, A-10C (VP-LI24) and Cedar Beach/Mt. Sinai Harbor (Appendix K, Figures A-11A, A-11B, A-11C (VP-LI11A)). As with Riverhead, these photo simulations confirm that the Broadwater Project will be consistent with features that already exist in Brookhaven's view shed and will not create an unusually discordant feature on the Sound. When visible, the Broadwater Project will generally appear as a small two-dimensional rectilinear form on the horizon from the distant coastal vantage points in the Town of Brookhaven. While the outline of the Broadwater Project will break the visible horizon from the distant coastal vantage points in the Town, the Project will appear quite low and, as distance increases, increasingly more difficult to distinguish from the horizon.

Broadwater also considered the potentially sensitive visual resources and vantage points within the Town of Smithtown as part of its recently-completed VRA. (*See* VRA, Appendix K). The FSRU will not be at all visible from Nissequogue State Park and the Sunken Meadow State Park, 24.2 and 25.1 miles from the FSRU, respectively (VP# LI48 and LI49, respectively).

As to those areas along the coast from which the FSRU and/or transiting LNG carriers will be visible as stationary or temporary features on the Sound, for those who recognize and understand that the Sound is a multi-purpose water body, the presence of the FSRU and LNG carriers will have little impact on their recreational experience. These features are consistent with already existing facilities and vessels on the Sound. See also WSR § 2.2.1.1. And while the presence of the FSRU and LNG carriers may diminish the aesthetic experience for those who believe that the Sound should be used strictly for recreational purposes during the operational life of the Broadwater Project, such a view is inconsistent with the Sound's historic and present use as a multi-purpose waterbody that simultaneously supports commerce, industry and recreation.

An important factor regarding the FSRU's visibility within the Sound is that it will be a temporary not permanent, feature on the waters. The decommissioning of the FSRU by its complete removal at the end of its useful life is a most favored fact in demonstrating compliance with the NYSDEC Visual Policy. The mooring tower may similarly be decommissioned or, alternatively, converted to a navigation aid.

Refer to Broadwater's discussion regarding the completed inventory of more than 100 potentially sensitive receptors, including those that contribute to the overall scenic quality of the Long Island Sound coastal community, as set forth in Broadwater's response to LIS CMP Policy 3.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 26** *Conserve and protect agricultural lands in the state's coastal area.*

The Broadwater Project will not impact the agricultural lands in the eastern Suffolk County portion of Long Island Sound's coastal area. First, the LNG terminal's siting location many miles off the Sound's coastline will not at all impact the Sound's existing onshore agricultural lands. Second, the onshore facilities associated with the Broadwater Project will be located in already existing sites that are commercially/industrially zoned and, thus, will not compete with Suffolk County's agricultural lands or open spaces. As such, this policy is not applicable to the Broadwater Project.

**POLICY 27** *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment, and the facility's need for a shorefront location.*

Refer to Broadwater's response to LIS CMP Policies 10 and 13 above for a discussion of the Broadwater Project's compliance with this policy.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.



**POLICY 28** *Ice management practices shall not interfere with the production of hydroelectric power, damage significant fish and wildlife and their habitats, or increase shoreline erosion or flooding, or interfere with the production of hydroelectric power.*

Broadwater is not anticipated to require ice management practices due to the constant circulation of the Sound's waters. In the coastal areas of Port Jefferson and Greenport, where Broadwater's proposed onshore facilities will be located, the ports are active all year long, with commercial activity continuing through the winter months.

**POLICY 29** *Encourage the development of energy resources on the outer continental shelf, in Lake Erie and in other water bodies, and ensure the environmental safety of such activities.*

The Broadwater Project is consistent with this policy because it will introduce a new supply of natural gas into the target markets, using the abundant and vast waters of Long Island Sound. Broadwater's selected location for its LNG terminal and interconnection pipeline in the central portion of Long Island Sound avoids certain safety issues that could otherwise be relevant to an onshore LNG facility. Here, the nearest coastal community will be a minimum of 9 miles from the FSRU. The Broadwater Project is also protective of and is taking multiple measures to protect the natural resources of Long Island Sound.

Additional discussion regarding the Broadwater Project's consistency with this policy is set forth in Broadwater's responses to LIS CMP Policies 1, 5, 8, and 13, above. Refer also to Broadwater's reports on Water and Sediment Quality and Air Quality, which are annexed as Appendix A and Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 30** *Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.*

The Broadwater Project is consistent with this policy because Broadwater will comply with state and national water quality standards that are applicable to the Broadwater Project. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5 and 8. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 31**     *State coastal area policies and management objectives of approved Local Waterfront Revitalization Programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already overburdened with contaminants will be recognized as being a development constraint.*

Given that the Broadwater Project will not involve review or modifying coastal water classifications or water quality standards, this policy is not applicable to the Broadwater Project.

**POLICY 32**     *Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.*

The Broadwater Project is consistent with this policy, for reasons set forth in LIS CMP Policy 8, above.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 33**     *Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.*

The Broadwater Project is consistent with this policy because Broadwater will use best management practices to control stormwater runoff and combined sewer overflows draining into coastal waters for any onshore facilities. In addition, because Broadwater will be using existing facilities for its proposed onshore locations, no water quality impacts from construction or operation of the proposed onshore facilities are anticipated.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5 and 8, above. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. See also Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 34**     *Discharge of waste materials into coastal waters from vessels subject to state jurisdiction will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.*

The Broadwater Project is consistent with this policy because Broadwater will operate in a manner that is protective of significant fish and wildlife habitats and recreational areas. In addition, the Broadwater Project is not anticipated to impact water supply areas within the Long Island Sound coastal region.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5, 6, and 8. Refer also to Broadwater's report on Water and Sediment Quality, which is annexed as Appendix A. *See also* Broadwater's Onshore Facilities Resource Reports, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 35** *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing state dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

Because the FSRU will be placed in a distant, offshore location, the Broadwater Project eliminates the need for dredging that would likely be necessary to accommodate the draft of LNG carriers servicing an onshore LNG terminal. No dredging at the existing facilities in the onshore locations to accommodate tugs or other vessels is anticipated as a result of the Broadwater Project.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in the Project Description set forth in Chapter 2, Section 2.2 *et seq.*, and in Broadwater's responses to LIS CMP Policies 1 and 5, above. *See also* Broadwater's Onshore Facilities Resource Reports, Section 1.2 at 1-5 to 1-6, which is annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 36** *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

The Broadwater Project is consistent with this policy as Broadwater will employ multiple measures to ensure the proper storage and shipment of petroleum and other hazardous materials to prevent or minimize the potential for spills into coastal waters. For proposed onshore facilities located in the Villages of Greenport and Port Jefferson, there will be no bulk storage of fuel required. Material handling at the waterfront facilities will involve the transfer of certain containerized liquids, such as aqueous ammonia and mercaptan. The liquid transfers would be facilitated by the use of 20-foot isotanks to ensure the safe transfer of such materials and minimize the potential for a spill or discharge. The onshore facilities will also provide an emergency response center for the Broadwater Project to ensure that the cleanup of unexpected, accidental discharges is expedited.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 1, 5, 6, 8.

See also Broadwater's Onshore Facilities Resource Reports, at pages 1-1 to 1-7, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 37**     *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.*

The Broadwater Project is consistent with this policy as Broadwater will employ multiple measures to minimize non-point discharge of excess nutrients, organics, and eroded soils into coastal waters. The proposed locations for onshore are already developed, paved locations. The Broadwater Project will not result in significant movement of land or excavation of these already developed locations. As such, the Broadwater Project will not result in uncontrolled or excessive non-point discharge of nutrients, organics and eroded soils into the coastal waters.

Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5 and 8. See also Broadwater's Onshore Facilities Resource Reports, at pages 1-1 to 1-7, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 38**     *The quality and quantity of surface water and groundwater supplies will be conserved and protected particularly where such waters constitute the primary or sole source of water supply.*

The Broadwater Project is consistent with the objectives of this policy because the proposed onshore business support facilities and related operations are not anticipated to result in impacts to the surface water or groundwater supplies. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5 and 8. See also Broadwater's Onshore Facilities Resource Reports, at pages 2-1 to 2-3, annexed as Appendix O.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 39**     *The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within the coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural land, and scenic resources.*

The Broadwater Project will be consistent with this policy because any transportation, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within the coastal areas in Greenport and Port Jefferson will be protective of groundwater and

surface water supplies, fish and wildlife habitats, recreation areas, agricultural lands, and scenic resources. A discussion of the fish, vegetation and wildlife habitat that exists at the proposed Greenport and Port Jefferson locations for Broadwater's onshore facilities is set forth in Broadwater's Onshore Facilities Resource Reports, Section 3.1 at 3-1 to 3-8, annexed as Appendix O. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policies 5 and 8.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 40** *Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.*

The Broadwater Project will be consistent with this policy, for reasons more fully set forth in Broadwater's response to LIS CMP Policy 5, above.

**POLICY 41** *Land use or development in the coastal area will not cause national or state air quality standards to be violated.*

The Broadwater Project is consistent with this policy because it will not cause national or state air quality standards to be violated. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's Air Quality, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 42** *Coastal management policies will be considered if the state reclassifies land areas pursuant to the prevention of significant deterioration regulations of the Federal Clean Air Act.*

The Broadwater Project will not involve reclassifying land areas pursuant to the PSD regulations of the Federal Clean Air Act. Therefore, this policy is not applicable to the Broadwater Project.

**POLICY 43** *Land use or development in the coastal area must not cause the generation of significant amounts of acid rain precursors nitrates and sulfates.*

The Broadwater Project is consistent with this policy because it will not result in the generation of significant amounts of acid rain precursors nitrates and sulfates. Additional analysis and discussion confirming the Broadwater Project's consistency with this policy is set forth in Broadwater's response to LIS CMP Policy 7, above. Refer also to Broadwater's Air Quality report, which is annexed as Appendix C.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

**POLICY 44**     *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

The Broadwater Project is consistent with this policy because there are no freshwater wetlands or NWI wetlands within or adjacent to the proposed locations for onshore facilities. Due to the distant, offshore location of the FSRU and interconnecting pipeline, these facilities will not impact any wetlands.

Refer also to Broadwater's Onshore Facilities Resource Reports, Section 3.1 at 3-1 and 3-8, annexed as Appendix O, for additional discussion regarding Broadwater's consistency with this policy. Refer also to Broadwater's response to LIS CMP Policy 6, above.

For all of these reasons, the Broadwater Project is consistent with the objectives of this policy.

#### **4.5     Statement of Coastal Zone Consistency**

The Coastal Zone Management Act (CZMA) declares that the public policy of the State within the coastal area is "...to achieve a balance between economic development and preservation that will permit the beneficial use of coastal resources while preventing the loss of living marine resources and wildlife, diminution of open space areas or public access to the waterfront, shoreline erosion, impairment of scenic beauty, or permanent damage to ecological systems" (N.Y. Exec. Law § 912). For all of the reasons set forth in Broadwater's consistency analysis herein, the Broadwater Project's balancing of economic development and environmental considerations is fully consistent with the policies of New York State's Coastal Management Program, including, more particularly, those 13 specific policies under the LIS CMP as well as the other potentially applicable LWRPs and HMPs discussed herein.

**APPENDIX E**

**MARINE/LAND USE COMPATIBILITY  
ASSESSMENT**

**REVISED  
October 2006**



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## **1.0 MARINE USE**

### **1.1 General Description of Long Island Sound Coastal Region and Marine Resources**

Long Island is the largest island adjoining the continental United States, extending approximately 118 miles (190 km) east-northeast from the mouth of the Hudson River. Totalling 1,377 square miles (3,580 km<sup>2</sup>) of land area, Long Island is divided into four counties: Kings (Brooklyn), Queens, Nassau, and Suffolk. The proposed floating storage regasification unit (FSRU) site and subsea pipeline route is located in Suffolk County, New York.

Land uses along the coastal areas of Long Island vary primarily according to the location on the island. The population and overall development is generally less dense on the eastern coastal areas of Long Island, including the area directly south of the proposed Project as well as areas to the east (i.e., eastern Suffolk County). Suffolk County's five eastern towns (Riverhead, Southampton, Southold, East Hampton, and Shelter Island) had a combined estimated population of 136,850 in 2004, or only 9% of the County's population, but occupy 42% of the county's land area. The estimated population of Suffolk County was 1,475,488 in 2004, and the Town of Brookhaven (estimated population 471,291) is Suffolk County's most populous town. The estimated population of Nassau County, which is immediately west of Suffolk County, was 1,339,641 in 2004.

The coastal area of eastern Suffolk County is much less urbanized than the western portion of the County. Eastern Long Island comprises a mix of agriculture, open space, and rural/low-density residential development. Some densely developed commercial/industrial uses occur along eastern Long Island, outside of organized maritime centers; however, most urban development occurs in the defined maritime centers such as Port Jefferson and Greenport (*see* Figures 1-1 and 1-2).

Regional land use patterns in the upland areas comprising the four larger towns traversed by the Suffolk County north shore watershed boundary are mixed. Residential development comprises 53% of the watershed acreage, with the majority of that category being low-density residential (*see* Table E-1).

**Table E-1 Regional Land Use in Towns Traversed by the Suffolk County North Shore Watershed Boundary**

	Huntington	Smithtown	Brookhaven	Islip	Total	Percent
Low-density residential	7,316	4,630	2,817	24	14,787	28.50%
Medium-density residential	3,415	4,198	3,854	134	11,601	22.30%
High-density residential	571	218	234	0	1,023	2.00%
Commercial	324	295	274	10	903	1.70%
Industrial	34	185	36	0	255	0.50%
Institutional	776	1,028	1,390	141	3,335	6.40%
Recreation and Open Space	4,279	4,670	1,283	55	10,287	19.80%
Agriculture	86	197	96	0	379	0.70%
Vacant	1,290	1,053	953	1	3,297	6.30%
Transportation	1,833	1,910	1,621	39	5,403	10.40%
Utilities	416	53	171	6	646	1.20%
Waste Handling and Management	0	19	6	0	25	0.10%
Freshwater surface	22	5	9	0	36	0.10%
<b>Total</b>	<b>20,362</b>	<b>18,461</b>	<b>12,744</b>	<b>410</b>	<b>51,977</b>	<b>100.00%</b>

Source: Suffolk County 2004.

## 1.2 Marine Resources and Potential Marine Use Conflicts in Long Island Sound

The proposed Project will be located in an open-water environment in Long Island Sound. The land use within which the offshore Project will be constructed and operated is designated entirely as open water. Onshore components of the Project will be located in waterfront locations with various land use designations (*see* Section 2). The offshore Project area falls under certain jurisdictions of the State of New York as the Project is entirely located within the New York portion of Long Island Sound. A summary of the entire Project area, including marine resources identified in the Sound and in the Race, as well as the proposed FSRU location and liquefied natural gas (LNG) carrier transit route, is presented on Figures 1-1, 1-2, and 1-2.1. The Race is the eastern entrance to Long Island Sound, between Fisher's Island and Gull Island, including Valiant Rock. (*see* Resource Report No. 8, Land Use, Recreation and Aesthetics, incorporated herein by reference). The U.S. Coast Guard, in its Waterways Suitability Report (2006), recommended the greatest extent of the safety and security zone for the Project as being 1,210 yards as referenced to the center of the mooring tower. The U.S Coast

Guard also established a traveling safety and security zone for the LNG carrier as it transits to the FSRU. The moving safety and security zone is recommended to be 2 nautical miles ahead, 1 nautical mile behind, and 750 yards to either side of the LNG carrier. An assessment of resources located in the vicinity of the proposed FSRU location, the LNG carrier transit routes, and the onshore portions of the Project are presented in this document. The assessment also identifies any potential conflicts or compatibility issues with marine and land uses in Long Island Sound and the resulting impact.

### **1.2.1 Shipping Routes and Designated Navigable Waters**

As the primary thoroughfare for accessing the commercial/industrial ports along the coast of Long Island and Connecticut, Long Island Sound continues to support a significant amount of commercial vessel traffic. In fact, approximately 46 million tons of petroleum and coal are currently moved annually by ship in the Sound. Navigation-dependent activities are very important to the economies of New York and Connecticut and comprise a significant portion of the use of the main body and port areas of Long Island Sound. Broadwater purposely sited the FSRU and interconnecting pipeline to avoid and minimize effects on other water-dependent businesses and activities. The Coast Guard's conclusions in the Waterways Suitability Report demonstrate the Project's avoidance and minimization of these effects.

There are no official vessel traffic routes in Long Island Sound. In the absence of a routing scheme in the Sound, reliance on federal navigational aides and the use of standard marine practice have led to the development of de facto traffic patterns and generalized shipping routes in the Sound. The generalized shipping routes illustrated on Figure 1-3 were identified by the U.S. Coast Guard as part of its Ports and Waterways Assessment (PAWSA) (U.S. Coast Guard 2005) conducted for Long Island Sound in May of 2005. The figure presents vessel routes identified using global positioning systems (GPS) onboard vessels that travel the Sound. While the figure may not depict all routes utilized by vessels, it does identify the primary routes utilized by commercial vessels in the Sound as determined by the U.S. Coast Guard. Maintained navigation channels are restricted to nearshore areas and within the rivers and harbors along the Sound. The locations of ports within the Sound and the presence of Stratford Shoal, which is centrally located in the Sound, largely dictate the specific paths that shipping follows in the Sound (*see* Figure 1-1). Following the installation of the FSRU and pipeline, all navigation maps

for the Sound would be updated to include both the FSRU location and the specific safety and security zone surrounding the facility, as designated by the U.S. Coast Guard.

The FSRU will be a permanent navigation constraint during its operational lifetime. However, as noted by the U.S. Coast Guard in the Waterways Suitability Report, the proposed location for the FSRU would not be within the predominance of existing commercial and recreational uses of the Sound. Construction of the pipeline that interconnects the FSRU with the existing Iroquois Gas Transmission System (IGTS) pipeline could result in a short-term impact on navigation due to the presence of construction vessels on the Sound. Navigational warnings and precautions will be implemented so as to not impede vessel traffic during the period required for pipeline construction and installation of the mooring structure. In addition, Broadwater will coordinate with the U.S. Coast Guard, and a Notice to Mariners will be issued with installation details. Construction vessels associated with the Project will maintain an open line of communication with all vessels during construction and installation activities.

### **Potential Marine Use Compatibility Issues**

As shown on Figure 1-4, there is a potential conflict between the historic shipping route that traverses the central portion of the Sound and establishment of the U.S. Coast Guard-required safety and security zone around the FSRU. The recommended 1,210-yard safety and security zone would overlap with a portion of this vessel transit route based on the transit data provided by the U.S. Coast Guard.

However, given the width of the shipping route, as demonstrated by the U.S. Coast Guard data and the findings of the Waterways Suitability Report, this minor conflict is manageable. Large commercial vessels transiting the Sound are controlled by local pilots who are aware of all navigational constraints in the Sound. Therefore, these vessel pilots would be well aware of constraints associated with the FSRU and the U.S. Coast Guard-designated safety and security zone and could modify their course of transit accordingly. By having the Broadwater facility located in the widest portion of the Sound, there is ample space to allow for navigation outside the U.S. Coast Guard's recommended safety and security zone.

#### **1.2.2 Subsea Utilities**

Several cables, pipelines, and other utilities traverse the bottom of Long Island



Sound. These utilities are largely buried beneath the seafloor except in specific locations where rock or other obstructions prevent complete burial. The Project's pipeline will cross subsea rights-of-way and other designated uses between the FSRU and IGTS tie-in location. These crossings are described below. Impacts on these existing subsea utilities will be temporary and limited to the construction phase of the Project.

- **Cross Sound Cable.** This submarine power cable traverses the Sound from New Haven, Connecticut, to Shoreham, New York. The proposed Broadwater pipeline route will require a single crossing of this cable.
- **AT&T Cable Corridor.** This submarine fiber-optic telecommunications cable corridor traverses the Sound from Shoreham, New York, to East Haven, Connecticut. The proposed Broadwater pipeline route crosses the corridor and associated cables.
- **IGTS Pipeline.** This pipeline runs from Northport, New York, to Milford, Connecticut. A subsea connection to this pipeline will be the terminus of the proposed Broadwater subsea pipeline.
- **MCI Cable Corridor.** This fiber-optic telecommunications cable corridor runs from Rocky Point, New York, to Madison, Connecticut. It is located east of the proposed FSRU location.
- **Cross Island Cables.** These seven power cables are contained within a corridor that crosses Long Island Sound from Northport, New York, to Norwalk, Connecticut. The corridor is located west of the proposed Broadwater pipeline's western terminus at the IGTS pipeline.
- **Flag Atlantic-1 North Cable.** This trans-Atlantic fiber-optic telecommunications cable extends from Northport, New York, to England. The portion of the cable in Long Island Sound runs south of the New York/Connecticut border and provides a direct communication link between New York City, London, and Paris. This cable is located south of the proposed Broadwater pipeline route and will not be impacted by the Broadwater Project.
- **IGTS Eastchester Extension.** This pipeline runs east-west in the Sound from Northport to Eastchester, New York, west of the Broadwater Project area.
- **Islander East Pipeline.** This proposed pipeline is routed to the east of the Broadwater Project area.

#### **Potential Marine Use Compatibility Issues**

There are no anticipated conflicts or compatibility issues with existing utilities in

Long Island Sound from either the FSRU or LNG carriers, or the associated safety and security zones, as these utilities are located beneath the seafloor. With the 1,210 yard safety and security zone recommended by the U.S. Coast Guard for the FSRU, existing facilities will be located well outside of the safety and security zone, allowing normal maintenance operations to occur as required, with no impact on either the Broadwater Project or the individual utilities. Installation of the Broadwater pipeline will create an additional utility right-of-way within the Sound that will need to be depicted on navigation charts to avoid future impacts. While the pipeline will require a new right-of-way, the extensive field investigations conducted by Broadwater demonstrate that, with the exception of Stratford Shoal, the bottom substrate is largely homogenous across the 21.7-mile length of the proposed pipeline. In addition, the substrate offers no unique habitat value, and installation of the pipeline will not impact the health of the Sound's ecosystems. Where the pipeline route traverses Stratford Shoal, which is largely characterized by a cobble substrate, the pipeline will be protected with rock or other imported fill material, which will not result in adverse impacts on any other existing marine uses.

### **1.2.3 Commercial Fishing/Designated Fishing Grounds**

#### **Commercial Fishing**

Long Island Sound has numerous areas that traditionally have been high-use fishing grounds and fishery areas. Shellfishing tends to predominate in the shallower nearshore Connecticut waters, while lobster fishing and finfishing predominate in the deeper central portions of the Sound. Whereas the nearshore shellfishing grounds are established through defined leases with the states, the finfish, and lobster industries tend to operate under informal agreements with regard to specific areas fished. Much of the nearshore area along the Connecticut coastline in proximity to the FSRU is designated for oyster and clam leases (*see* Figure 1-1). In New York, the New York State Department of Environmental Conservation (NYSDEC) has designated offshore areas in Long Island Sound as Marine Use Assignment Areas, which are located close to the New York shoreline, away from both the proposed FSRU location and subsea pipeline route. Marine Use Assignments are 5-acre parcels within which NYSDEC permits use by shellfishermen for off-bottom culture of shellfish. Hard clams and Eastern oyster are the most actively fished commercial species in the region, accounting for more

than 74% of the total revenues in 2001. Given Broadwater's location in the deeper waters of the central Sound, impacts to the hard clam and oyster industries are avoided, thus preserving the most economically important component of the commercial fishery.

Historical use maps of the Sound prepared by the Connecticut Department of Environmental Protection (CTDEP) indicate that nearly all of the western two-thirds of the Sound, including the area being considered for the FSRU and pipeline, are classified as a high-use lobster fishery area. Although lobstermen are required to renew permits on a yearly basis, the state agencies do not provide leases for particular portions of the Sound. Rather, territories have been determined largely through historic usage and informal agreements between the fishermen.

Historically, the lobster fishery was a significant part of the shellfish industry in the Sound; however, lobster catches have decreased significantly in recent years because of a die-off that began in 1998. Despite the lobster die-off that has occurred in recent years, the Project area continues to be heavily fished for lobsters. Finfishing also takes place throughout the Sound, although trawl fishing is limited because of the density of lobster pots throughout the Sound.

For the years leading up to the die-off, lobstermen throughout Long Island Sound landed an average of 10 million pounds (4.5 million kilograms) of lobster per year, with a total value of \$32 million annually. Since the die-off, the landings have fallen to 1.44 million pounds (650,000 kg), and the value has declined to approximately \$5.1 million. As a result, several lobstermen have chosen to pursue finfish and shellfish after modifying their vessels and gear, while others have dropped out of the industry. Tables E-2 and E-3 summarize the top five commercial fish landings, in terms of dollars, for New York and Connecticut for the years 2002 and 2003.

**Table E-2 Top Five Commercial Fishing Landings, in Terms of Dollars, for New York and Connecticut (2002)**

Location of Species	Pounds	Value	Price per Pound
<b>New York</b>			
Quahog clam	1,501,752	\$12,244,654	\$8.15
Longfin squid	9,613,411	\$6,246,554	\$0.65
Atlantic surf clam	8,543,690	\$5,519,822	\$0.65
American lobster	1,440,483	\$5,131,295	\$3.56
Eastern oyster	536,958	\$4,994,990	\$9.30
<b>Connecticut</b>			
Quahog clam	3,434,844	\$9,202,241	\$2.70
Sea scallop	1,578,640	\$6,399,897	\$4.05
American lobster	1,067,121	\$4,225,522	\$3.96
Eastern oyster	246,669	\$2,012,161	\$8.16
Longfin squid	1,778,266	\$1,178,428	\$0.66

Source: National Oceanic and Atmospheric Administration (NOAA) Fisheries Department (NOAA Fisheries) 2005.

**Table E-3 Top Five Commercial Fishing Landings, in Terms of Dollars, for New York and Connecticut (2003)**

Location of Species	Pounds	Value	Price per Pound
<b>New York</b>			
Quahog clam	1,552,946	\$12,399,024	\$7.98
Atlantic surf clam	13,263,570	\$7,934,420	\$0.60
American lobster	946,449	\$4,426,316	\$4.68
Longfin squid	4,602,936	\$4,353,264	\$0.95
Eastern oyster	466,117	\$4,262,701	\$9.15
<b>Connecticut</b>			
Quahog clam	4,038,021	\$10,469,996	\$2.59
Sea scallop	1,907,675	\$8,124,639	\$4.26
American lobster	671,119	\$3,170,088	\$4.72
Eastern oyster	279,414	\$2,273,760	\$8.14
Silver hake	2,453,756	\$1,460,245	\$0.60

Source: NOAA Fisheries 2005.

## **Lobster Fishing**

Throughout Long Island Sound, fishing occurs according to territories established through cooperative agreements between and among the fishermen. Lobster fishing and other fishing utilizing fixed gear is ubiquitous throughout the Sound, with very high lobster pot densities in some areas. Lobster pots are usually set in a series, with 5 to 15 traps being most common. The pots are strung on a ground line about 60 to 100 feet apart. Buoys marking these lines of lobster pots can be set at intervals of 500 feet or less. Based on an average of 10 pots per line and 500-foot intervals between buoys, lobster pot densities could be as high as 1,000 per square mile. However, given the overall reduction in lobster pots that has occurred in the last 7 years, the actual number of traps set in any given area is likely to be considerably less. NYSDEC estimates that approximately 110,910 lobster traps were set in all of Long Island Sound (including the East End) in 2004 (*see* Table E-4). Based on this data, 32,336 lobster traps were set in eastern Long Island Sound (where the FSRU would be located) in 2004. This represents a

decrease of approximately 76,000 traps from 1998 (i.e., prior to the significant lobster die-off in the Sound) when 108,413 traps were set.

**Table E-4 Lobster Trap Use Reported on Annual Recall Survey**

Year	Western Long Island	Eastern Long Island	East End	Total Long Island Sound
1998	162,457	108,413	28,926	299,795
1999	161,910	102,024	40,447	304,381
2000	81,835	80,065	30,406	192,306
2001	80,708	71,205	24,095	176,007
2002	57,207	65,862	21,556	144,624
2003	40,307	36,011	12,654	88,971
2004	52,971	32,336	25,604	110,910

Source: NYSDEC 2005.

### **Trawling Lanes/Finfishing**

In order to avoid conflict between fishermen using fixed gear and fishermen who trawl, specific areas have been agreed upon as trawling lanes. In general, trawling is limited in the Sound due to the predominance of fixed-gear lobster fishing. Trawling lanes were identified during the initial consultation with local fisherman and through information presented in the *Environmental Impact Statement for the Designation of Dredge Material Disposal Sites in Central and Western Long Island Sound, Connecticut and New York* (EPA 2004). Designated trawling lanes in Long Island Sound are shown on Figure 1-5. See also Waterways Suitability Report at § 3.1.2.3.1.

Lobster fishermen report fishing 12 months of the year, with two peak periods, one in the spring/summer (beginning sometime between February and April and continuing through August) and one in the fall/early winter (late October through December). Fishermen who trawl reported fishing from April to June, August to October, and December to January. Table E-5 provides a summary of the species fished, gear type, and fishing periods reported by fishermen interviewed during the survey.



**Table E-5 Species Fished, Gear Used, and Fishing Periods**

Species Fished	Gear	Fishing Periods
Lobster	Lobster traps/pots	12 months (beginning sometime between February and April and continuing through August, and in late October through December; peak in the spring/summer)
Primary lobster by-catch: tautog (blackfish), black sea bass	Lobster traps/pots	
Other lobster by-catch: scup (porgies), conch, squid, summer flounder	Lobster traps/pots	
Tautog (blackfish)	Fish pots	
Conch	Conch pots	
Scup (porgies), summer flounder, tautog (blackfish), bluefish, striped bass, squid, flounder, and butterfly	Fish traps, nets, hook and line	12 months (target species change with seasons)
Scup (porgies), summer flounder, tautog (blackfish), bluefish, striped bass, squid, flounder, and butterfly	Trawl	Focused efforts from April to June, August to October, and December to January (target species change with seasons)

Broadwater undertook a fishermen's outreach program for the proposed Project in order to identify interested parties that utilize the Sound for commercial and recreational fishing and to identify those that may be impacted by the Project. (*see* Appendix F). Information obtained from commercial and recreational fishermen through a telephone survey included: areas fished in Long Island Sound, targeted species, gear type, seasons fished, and concerns related to the proposed Project. The outreach program also included review of information provided by NOAA Fisheries related to catch in the Project area.

The majority of interviewed commercial fishermen (> 90%) target lobster with fixed gear (lobster pots/traps). This corresponds with reports of lobster fishing dominating the commercial fishing industry in Long Island Sound. Approximately half of the lobster fishermen target only lobster and half also harvest finfish.

A discussion of the potential marine conflicts and economic impacts associated with removal of areas fished is discussed below. A comprehensive economic impact analysis discussing impacts on commercial fisheries is presented in Appendix F, and the Fisherman Outreach Study is provided in Appendix H.



## **Potential Marine Use Compatibility Issues**

### **Lobster Fishery**

Using the recommended 1,210 yard safety and security zone surrounding the stationary tower structure/FSRU, an order-of-magnitude estimate of the number of potentially displaced lobster pots and lobstermen and an estimate of the overall direct and indirect economic impact on the lobster industry can be made. As discussed below, the projected economic losses associated with the Project are not significant in terms of the overall industry production, and any adverse economic impacts can be easily offset by Broadwater.

The trawling lane that parallels the New York and Connecticut border (*see* Figure 1-5) may be impacted by the FSRU and the associated safety and security zone. However, as shown on Figure 1-5, the established trawling lane is wide enough to accommodate trawling to the north. Section 3.1.2.3.1 of the Waterways Suitability Report states that ‘very few commercial trawl vessels utilize these lanes; generally, fishing occurs in summer during the month of August’.

### **Economic Impacts of Lobster Fishing**

Future annual landings for the safety and security zone were estimated. Detailed procedures and methodologies employed for this study which address value of average landings and density of lobster pots in Long Island Sound are provided in Appendix F. Based on recent average lobster pounds caught per pot in the Project ocean area (*see* Figure 1-6) and a potential range of potential lobster pots per trawl in Long Island Sound, the analysis indicates a restricted access area of 1,210 yards from the FSRU radius would, for example, correspond to annual lobster landings valued at between \$8,000 and \$32,000 per year depending on the number of pots attached to a trawl. In other words, at 15 pots per trawl, the annual value of landings contained within the recommended 1,210 yard safety and security zone would average \$24,000 (*see* Table E-6).

**Table E-6 Direct Economic Impacts-Summary  
Analysis Based on Range of Lobster Pots  
per Trawl**

Pots per Trawl	Economic Impact
<b>Value of Average Annual Landings (2010-2040)</b>	
5	\$8,042
10	\$16,084
15	\$24,126
20	\$32,168
<b>Cumulative Present Value of Future Annual Landings (2010-2040)</b>	
5	\$130,224
10	\$260,447
15	\$390,671
20	\$520,894

Also, as illustrated by Table E-6, the estimated cumulative present value of future landings is estimated to be approximately \$521,000 over the life of the Project. This represents a potential worse case economic loss scenario over the lifetime of the Project.

In addition to direct impacts, indirect and induced impacts were estimated. Direct economic loss has an indirect economic impact or stimulus on the suppliers and firms that are the recipients of subsequent rounds of spending related to the impacted activity. In addition, employees and households that earn wages from these industries are also impacted and they in turn spend a portion of their incomes in NYS. These latter impacts are called induced effects. The direct, indirect and induced impacts are summed and are called total economic impacts. The indirect and induced impacts represent the multiplier or ripple effects that are generated from the initial direct impacts on the lobster landings revenues.

The total economic impacts associated with the potential loss of lobster revenues due to the recommended 1,210 yard safety and security zone were estimated for an average year, and also over the long-term 30 year operational life of the Project (*see* Table E-7). The long-term impacts were estimated for each year over the life of the Project and also expressed as a cumulative present value sum. The cumulative present value sum is a measure of the total long-

term impact in present worth terms. Table E-7 also presents the impacts to employee compensation, total value added and employment. With the recommended 1,210 yard safety and security zone for the Project, the total cumulative economic impact to the lobster fishing industry is estimated at approximately \$649,000 in present values terms over a 30-year period. This represents the potential worst case scenario.

**Table E-7 Summary of Economic Impacts to NYS Associated with Ocean Area Size Equivalent to the FSRU Safety and Security Zone-Average Year and Long-Term Cumulative Impacts**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
<b>Total Industry Output</b>		
Direct	\$24,126	\$324,969
Indirect	\$9,333	\$125,717
Induced	\$14,706	\$198,089
Total	\$48,166	\$648,775
<b>Employee Compensation</b>		
Direct	\$5,585	\$75,231
Indirect	\$3,227	\$43,460
Induced	\$4,669	\$62,894
Total	\$13,481	\$181,585
<b>Total Value Added</b>		
Direct	\$15,013	\$202,222
Indirect	\$5,386	\$72,547
Induced	\$9,471	\$127,570
Total	\$29,870	\$402,340
<b>Employment</b>		
Direct	1.3	40
Indirect	0.1	2
Induced	0.1	4
Total	1.5	46

## Commercial Finfishing

The following section provides an evaluation and estimate of the value of commercial fishery landings that would potentially be forgone because of fishing grounds not being accessible over the proposed Project's 30-year lifetime due to establishment of a safety and security zone around the FSRU. Methods, assumptions, and procedures are also summarized. The comprehensive economic impact analysis evaluating overall impacts on commercial fisheries, recreation and tourism, and vessel traffic is attached as Appendix F.

The future annual value of commercial fish landings (2010 to 2040) are defined as the direct economic impact. The impact estimates are presented for an average year and for a period spanning the life of the Project.

The method used to estimate the value of commercial fisheries landings was based on using an extract of the commercial species landings data within the East End and West End of Long Island Sound provided in the Fisherman's Outreach report (*see* Figure 1-6). The annual value of landings corresponding to the species within the circular areas was projected forward over the 30-year life of the Project to arrive at an estimate of long-term impacts. No assumptions were made concerning species population growth or catch effort over this time period. The direct economic impacts and value of commercial fish landings represent order-of-magnitude estimates using available information.

The data for commercial landings within the wide ocean area was scaled to estimate landings attributable to the recommended 1,210 yard safety and security zone ocean area (*see* Table E-8). Data was assembled on the total acreage corresponding to the ocean area between the East End and West End lines as displayed in Figure 1-6. The Project safety and security zone (in acres) was compared to the total acreage of the trawl areas. Table E-8 presents the results of these comparisons, while Figure 1-5 identifies the trawling areas.

The data in Table E-8 was used to scale the total landings data for the larger ocean area based on the acreage of the recommended safety and security zone. The direct economic impact estimates assume that similar types of species would be landed at depths corresponding to the ocean areas of the recommended FSRU safety and security zone location.

**Table E-8 Comparison of Long Island Sound  
Trawl Areas and Project Fishing  
Areas**

Trawl Areas	Acres	Square Miles
A	16,734.26	26.15
B	2,582.32	4.04
C	2,209.21	3.45
<b>Total</b>	<b>21,525.79</b>	<b>33.64</b>

Safety and Security Zone	Acres in Trawl Area	Percent of Total Trawl Area
1,210 yards	413.42	1.9%

Table E-8 shows the results of applying the scaling factors. Then Table E-9 shows the results of scaling the East End to West End Ocean Area by the acres corresponding to the Project's projected safety and security zone.



**Table E-9 Species, Total Live Pounds, and Estimated Value of Fish Harvested in Long Island Sound Commercial Fisheries During the 2002 and 2003 Fishing Seasons as Provided by NOAA and Estimated Values**

Long Island Sound East to West End Ocean Area <sup>a</sup>				Recommended Safety and Security Zone Ocean Area Surrounding Project FSRU	
No.	Species	Pounds	Value	Landings in Pounds	Estimated Value of Landings
1	Angler	43,680	\$34,462	838.91	\$661.87
2	Scup	40,733	\$29,200	782.31	\$560.81
3	Bluefish	14,827	\$5,130	284.76	\$98.53
4	Flounder, Summer	12,513	\$24,744	240.32	\$475.22
5	Tautog	3,642	\$6,117	69.95	\$117.48
6	Butterfish	3,527	\$2,138	67.74	\$41.07
7	Squid (Loligo)	1,810	\$1,358	34.76	\$26.08
8	Skates	1,767	\$251	33.94	\$4.82
9	Sea Robbins	1,222	\$202	23.47	\$3.89
10	Sea Bass, Black	1,093	\$2,609	20.99	\$50.11
11	Flounder, Yellowtail	770	\$846	14.79	\$16.25
12	Flounder, Winter	572	\$648	10.99	\$12.44
13	Bass, Striped	272	\$681	5.22	\$13.08
14	Dogfish, Smooth	189	\$58	3.63	\$1.12
15	Hake, Red	92	\$37	1.77	\$0.70
16	Croaker, Atlantic	26	\$13	1.05	\$0.25
17	Eel, Conger	25	\$14	0.48	\$0.27
18	Bonito	12	\$18	0.23	\$0.35
19	Flounder, Sand-Dab	4	NA	0.08	na
	<b>Total:</b>	<b>126,776</b>	<b>\$108,527</b>	<b>2,434.83</b>	<b>\$2,084.34</b>

Table E-9 shows the results of the scaling calculations using the relative number of trawl area acres to estimate the value of fish landings. The table shows that, by applying this method, the recommended FSRU safety and security zone area would correspond to several thousand dollars worth of fish landings within an average year.

The annual value of dockside landings was used to project the total economic impacts corresponding to this ocean area as shown below. Table E-10 shows the estimated direct economic impact. Since the impacts are expected to occur in future years, the annual and cumulative value of landings are expressed in present value terms using a 5% discount rate to acknowledge the time value of money.

**Table E-10 Summary of Economic Impacts to NYS Commercial Fisheries Average Year and Long-Term Cumulative Impacts with Recommended 1,210 Yard Safety and Security Zone**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
<b>Total Industry Output</b>		
Direct	\$2,211	\$35,809
Indirect	\$855	\$13,853
Induced	\$1,348	\$21,828
Total	\$4,415	\$71,489
<b>Employee Compensation</b>		
Direct	\$512	\$8,290
Indirect	\$296	\$4,789
Induced	\$428	\$6,930
Total	\$1,236	\$20,009
<b>Total Value Added</b>		
Direct	\$1,376	\$22,283
Indirect	\$494	\$7,994
Induced	\$868	\$14,057
Total	\$2,738	\$44,334

The estimated commercial landings in pounds were held constant over the projection period but the annual unit value (\$/lb) used to calculate the annual value of landings was increased over time based on the historic trend growth rate for all combined species. The long-term, or cumulative, total impact over the 30-year life of the Project would be approximately \$71,000 in present value terms with the recommended 1,210 yard safety and security zone.



## **Potential Habitat Sanctuary Impacts**

It is possible that the loss of fishing access to the safety and security zone area may enhance select populations of commercially valuable species by functioning as a de facto haven where fishermen are precluded from entering and placing stress on these populations. The restricted access may potentially lead to a rebound in overstressed species by allowing select populations at formative lifecycle stages to recover unimpeded by the threat of fishing gear and boats. This potential impact has not been quantified or estimated, but it should be considered as a form of de facto mitigation over the life of the Project.

### **1.2.4 Dumping Grounds**

Several active and inactive dumping grounds are located in Long Island Sound. The active dumping grounds include the Central Long Island Sound Disposal Site, the Cornfield Shoals Disposal Site, and the Western Long Island Sound Disposal Site. All of these sites are located in Connecticut waters. No portion of the proposed Project is located within, or in the vicinity of, these disposal sites (*see* Figure 1-1).

Inactive or historic disposal sites include the Southport Historic Disposal Site, the Bridgeport Historic Disposal Site, the Smithtown Historic Disposal Site, and the Port Jefferson Historic Disposal Site. The Port Jefferson Disposal Site, which is located approximately 1 mile (1.6 km) south of the proposed pipeline route, is the disposal site closest to the Project area. The site may have been used for disposal of sediments from Port Jefferson Harbor or other local projects, and any use would have occurred prior to 1977 (Fredette 2005; Gregus 2005). The site is located in an area with an erosional/non-depositional sedimentary environment. Historic disposal sites were located in these areas to allow any dumped sediment to be dispersed by natural hydrology. Based on Broadwater's spring 2005 sampling effort, no evidence of elevated contamination was identified within the identified Port Jefferson Disposal Site. No other known historic disposal sites are located within the area affected by the proposed Project.

## **Potential Marine Use Compatibility Issues**

Based on the current Project alignment, no marine use impacts or conflicts on or from dump sites are anticipated.

### **1.2.5 Shipwrecks**

Based on information obtained from the NOAA Automated Wreck and Obstruction Information System, there appear to be several identified wrecks in the general Project area, the majority of which are in the vicinity of the Stratford Shoal Middle Ground Area. In March and April 2005, Broadwater conducted a preliminary survey that included bathymetry, side-scan sonar, and magnetometer studies to develop a route for the proposed pipeline.

### **Potential Marine Use Compatibility Issues**

No shipwrecks are located within the central construction corridor. Within the proposed anchor spread, a total of nine anomalies were identified that could potentially be significant cultural resources. During construction, safety and security zones will be established around each of these targets, and midline buoys will be used to avoid impacts on these targets. As such, no impacts on shipwrecks, or any potentially significant cultural features, are expected. Resource Report No. 4, Cultural Resources, incorporated by reference herein, provides complete details of the archaeological investigations completed for the Project (*see* Environmental Reports, Confidential and Privileged Volume, Volume VII).

### **1.2.6 Lightering Zones**

Lightering zones are designated locations for anchoring and ship-to-ship transfer operations. Several lightering zones are located in Long Island Sound (*see* Figure 1-1). These lightering zones were identified by reviewing current NOAA navigation charts for the Sound.

The lightering zones closest to the proposed FSRU location include one located south of East Haven, Connecticut, in Connecticut waters, and one located north of Riverhead, New York, in New York waters. The lightering zone south of East Haven, which is closest to the FSRU, is more than 2.5 miles (4 km) from the proposed facility location.

The lightering zones closest to the proposed pipeline include one located north of Port Jefferson, New York, in New York waters, a zone north of Fort Salonga, New York, in New York waters, and a zone located south of Bridgeport, Connecticut, in Connecticut waters (*see* Figure 1-1). The zone north of Port Jefferson, which is closest to the proposed pipeline route, is approximately 0.5 mile (0.8 km) from the proposed facility location.

## **Potential Marine Use Compatibility Issues**

No direct impacts or conflicts with any of these areas are expected. Indirect impacts may include temporary rerouting of vessel traffic into these areas during construction activities. All appropriate notifications will be made and standard marine practices and precautions will be followed so as to not interfere with anchoring or lightering activities.

### **1.2.7 Vessel Traffic**

Vessel traffic in Long Island Sound includes commercial shipping, recreational boating, ferry services, and sightseeing tours. Each aspect of vessel traffic in the Sound is discussed below. A discussion of the anticipated increase in vessel traffic from the proposed Project, anticipated change in type of vessel traffic that will transit the Sound, and potential vessel traffic conflicts is provided below.

#### **Commercial Shipping**

Information on commercial vessel traffic from the United States Army Corps of Engineers (USACE) was gathered and analyzed in consultation with the U.S. Coast Guard Vessel Traffic Service New York, the New York Pilots Association, and USACE. Domestic and foreign traffic were addressed, but fishing vessels and escort tugs were not included. Each of the deepwater ports receives transit tankers that are similar in size to LNG carriers.

Commercial shipping in the Project area mainly involves vessels arriving and departing the ports of Northport, Northville, and Asharoken, New York, and Bridgeport and New Haven, Connecticut. Based on USACE data, the Connecticut ports receive significantly more traffic than the New York ports. Bridgeport is the most active commercial port in the Sound, with over 10,000 vessels per year. New London registers over 5,000 vessels per year, and New Haven approaches 2,000 vessels per year. Typical cargo for these ports includes oil, other petroleum products, bulk chemicals, and containerized goods. While the vast majority of the vessels calling on these ports will be significantly smaller than the LNG carriers, the Waterways Suitability Report identifies 69 US flagged vessels and 939 foreign commercial vessels 500 feet or greater in length arrived in Long Island Sound between 2003 and 2005. Of these vessels 306 are greater than 700 feet in length (Waterways Suitability Report Table 2-5). Additional vessel traffic in the Sound is associated with vessels calling on ports of New York and New Jersey.

While the vast majority of ships servicing ports in New York and New Jersey leave New York Harbor via southern channels, it is estimated that one to two ships per month utilize Long Island Sound.

As mentioned previously, in the absence of a traffic routing scheme in Long Island Sound, federal navigational aids and standard marine practices have led to the development of established traffic patterns and generalized shipping routes in the Sound. The main shipping route runs generally down the center of the Sound on a straight course from deepwater areas in the eastern Sound to the deepwater pass through Stratford Shoal, with a secondary shipping route trending from northeast to southwest toward Northport, New York. Traffic branches off to enter deepwater ports (*see* Figure 1-3). Broadwater located the proposed FSRU outside of this traffic pattern specifically to avoid and minimize impacts on commercial shipping.

Table E-11 presents 2003 commercial vessel traffic counts for deepwater ports in Long Island Sound as provided by USACE. Ports and traffic routes are depicted on Figure 1-3.

**Table E-11 Commercial Vessel Traffic in Long Island Sound (2003)**

Deepwater Ports <sup>1</sup>	Vessel Trips per Year	Transit Tankers
Bridgeport, CT	21,588	27
New London, CT	10,564	10
New Haven, CT	3,603	469
Port Jefferson, NY <sup>2</sup>	21,943	—
Northville, NY	1,207	31
Asharoken, NY	282	11
New York, NY <sup>3</sup>	50	50
Northport, NY	24	Unknown

Source: USACE 2005.

<sup>1</sup> Foreign and domestic traffic were totaled for deepwater ports; fishing vessels and escort tugs were not included.

<sup>2</sup> Vessel traffic received at Port Jefferson is significant; however, vessels range in size from less than 500 gross registered tons (GRT) to 25,000 GRT. Two transit tankers were noted in the overall traffic numbers that are likely similar in appearance to an LNG carrier. However, they are much smaller in size.

<sup>3</sup> While 21,789 vessels were reported for New York Harbor, the majority of these vessels do not approach through Long Island Sound due to strong currents.

In May 2005, a PAWSA was conducted for Long Island Sound in which the U.S. Coast Guard provided vessel arrival data for the significant harbors in Long Island Sound. The PAWSA was conducted to understand and address issues associated with waterway risks and potential intervention actions to avoid waterway risks, including the Broadwater Project. The process involved gathering together a select group of waterway users and stakeholders to evaluate waterway risk factors in Long Island Sound and the effectiveness of various intervention factors.

The PAWSA-generated data differed from the USACE-derived data in that only vessels required to provide a Notice of Arrival under the Vessel Traffic Service were included, making this a subset of the total vessel traffic.

### **Ferry Routes**

Several ferry services operate year-round in Long Island Sound and Block Island Sound, and coordination between the Project and potentially affected ferry operators began

during the U.S. Coast Guard's PAWSA Workshop. Broadwater has been actively engaged with ferry operators throughout this Project.

Installation of the subsea pipeline may have some minor, temporary impact on the Port Jefferson-to-Bridgeport ferry service. Due to the linear nature of the Project, the installation activity and associated construction barges, boats, and tenders will move along the route and not stay in one area for long. During construction operations, Broadwater will closely coordinate schedules with the ferry operator to provide for minimal disruption to the ferry schedule. Once the pipeline has been installed, no impact would occur as a result of operation of the pipeline.

### **Other Vessel Traffic**

The Naval Submarine Base New London is located in Groton, Connecticut (*see* Figure 1-2), and most of the naval vessels operating from New London are submarines. For security purposes, the exact routes of naval submarines are not published and are, therefore, not shown on the figure. Although impacts on naval vessels are not expected, coordination and communication between the Navy and LNG carriers will be required to ensure that scheduling requirements are enforced and there are no safety concerns with these vessels as they transit this area. In addition, the U.S. Coast Guard is charged with providing security zones around submarines as they travel through the Sound. The U.S. Coast Guard would have the same responsibility for safeguarding LNG tankers. As a result, coordination of the tanker and submarine traffic should not be a problem, according to the captain of the port for Long Island Sound, Captain Peter Boynton. *See* "CG Captain Sees Subs, Tankers Co-existing; Security zones for LNG vessels in L.I. Sound viewed as routine," Paul Choiniere, *The Day*, 3/16/06.

### **Potential Marine Use Compatibility Issues**

#### **Potential Conflicts with Commercial/Recreational Vessels in the Race.**

The greatest potential for marine conflict would arise from the operation of the FSRU and the ingress and egress of LNG carriers, particularly in the area of the Race, the eastern entrance to Long Island Sound and a critical waterway connecting Long Island Sound to Block Island Sound (*see* Figure 1-7). Vessels using the Race include a broad mix of naval vessels with traveling security zones, commercial deep-draft vessels, commercial fishing vessels, and

recreational fishing and pleasure crafts. Even with the real restrictions imposed, the Race does currently not have a Traffic Separation Schedule (TSS). During high traffic periods, mainly summer and holidays, the Race can be relatively congested.

Navy vessel data is not tracked in U.S. Coast Guard's PAWSA database, but these vessels likely consist primarily of submarines. Broadwater will continue to coordinate with the Navy regarding the coordination of vessel passage, but based on the infrequency of LNG carriers, this issue can be readily managed as described in the Waterways Suitability Report at § 4.6.1.2.

As mentioned, commercial vessels will have pilots on board, which allows for close coordination of incoming and outgoing commercial vessels. Given that the Race currently constricts passage of larger commercial vessels, continued coordination between the pilots will ensure that conflicts are appropriately managed. An LNG carrier and a commercial vessel would not be able to simultaneously pass through the Race due to the narrow passage and recommended safety and security zone requirements. If an LNG carrier and a commercial vessel arrive at the Race at the same time, one vessel will need to wait while the other passes through. Broadwater has estimated that it would take approximately 15 minutes to pass through the Race, resulting in no significant delay for other commercial vessels. Based on Broadwater's current proposal, only two to three carriers per week would call on the FSRU, minimizing conflict at the Race.

There is a significant amount of push or pull barge traffic in the Race area and this consists of the largest traffic density as identified in the PAWSA database. Since two commercial vessels cannot pass through the Race simultaneously, either the LNG carrier or the barge/tug would need to wait until the other has cleared the Race. This is consistent with the current procedures observed in the Race.

Most of these vessels transit through the Race during periods of little or no tidal currents. Due to strong tidal currents in the Race, most commercial and recreational fishing vessels likely cross the Race during slack tide. Therefore, Broadwater may be able to schedule LNG carrier traffic through the Race outside of slack water periods and may also be able transit the Race during nighttime hours when there is less traffic present in the Race area. Once through the Race, the vast majority of commercial traffic heading toward Connecticut ports would not be impacted by LNG carrier transits, with the commercial traffic utilizing the northern of the two



primary shipping routes and the LNG carriers using the southern route. Based on the PAWSA data, approximately 20% of the commercial traffic services either the New York ports or the offshore Northport Terminal/Riverhead Terminal. There is ample room within the eastern portion of the Sound for these vessels to pass at a safe distance.

Due to the overall size of Long Island Sound, there will be ample room for both LNG carriers and fishing or recreational vessels to avoid conflict. NYSDOS has raised concerns regarding potential impacts on existing lobster fishing (i.e., set trap lines) resulting from the transit of the LNG carriers. However, the LNG carriers will be routed along an existing, recognized shipping route that experiences regular commercial usage. Therefore, any conflict resulting from increased vessel traffic due to the presence of the carriers will be a conflict that the lobstermen already experience.

### **LNG Carrier Routing**

An analysis of the proposed LNG carrier routes was conducted to evaluate potential marine conflicts in the area of the Race and along the LNG carrier routes entering into Block Island Sound and Long Island Sound from the Atlantic Ocean. The analysis covers shorelines and relevant offshore features from Point Judith, Rhode Island, and Montauk, New York, to the entrance into Long Island Sound at the Race and onwards to the proposed FSRU location. This includes an analysis of the shoreline features of Rhode Island, the far eastern shorelines of New York and Connecticut, and Block Island. The LNG carrier route and associated safety and security zone are indicated on Figure 1-2.

An LNG carrier will transit to the proposed FSRU on average once every two to three days. Based on preliminary routing, there are two routes that LNG carriers may take when entering Block Island Sound prior to entering Long Island Sound via the Race:

- The Northern Route, which runs between Block Island and Point Judith, Rhode Island; and
- The Southern Route, which enters Block Island Sound via the Montauk Channel.

For both routes, the LNG carriers would be nearest the shoreline as they enter Long Island Sound via the Race. As described in Section 3.2.5.3 of the Waterways Suitability

Report, LNG carriers transiting the Race will pass within 1.4 miles of Fishers Island NY.

**The Northern Route.** The Northern Route is assumed to start at the U.S. territorial border south and east of Block Island and follow a north-northwesterly course to the pilot station located north of Block Island. At this location, the LNG carrier would be approximately 4.3 nm (5 statute miles) from Point Judith, Rhode Island. Along the remainder of the inbound transit from north of Block Island to the proposed FSRU location, the carrier would follow a route that is not less than 3.3 nm (3.8 statute miles) from the shoreline of Rhode Island, Connecticut, or New York.

The Northern Route is approximately 87 nm (100 statute miles) in length, and water depths exceed 100 feet (30.5 m) for the majority of the route.

**Southern Route.** Arriving LNG carriers would approach the Southern Route from a northerly course beginning at the U.S. territorial border (*see* Figure 1-2), on a heading toward the Montauk pilot station near waypoint S2. With the exception of the initial waypoints, the route is similar as described for the Northern Route. The length of this leg is approximately 78 nm (90 statute miles).

**Potential Conflicts with Vessels during Pipeline Installation.** No significant, permanent impacts on, or conflicts with, commercial shipping are expected to result from installation or operation of the subsea pipeline. Installation of the pipeline will be completed in an approximately 6-month time frame between October and April. Although the pipeline construction route will infringe temporarily on the shipping route approaching Bridgeport, Connecticut, due to the linear nature of the Project, the installation activity and associated construction barges, boats, and tenders will move along the route and not stay in one place for long. The offshore areas allow for movement of commercial vessels from one place to another; therefore, commercial shipping can continue in other areas as the Project installation moves across the Sound. Constant communication between construction vessels and other commercial traffic will ensure that adequate safety margins are maintained.

There is an established performance history associated with constructing subsea utilities (i.e., natural gas pipelines, submarine electric transmission cables, and submarine fiber-optic cables) within Long Island Sound. All of these projects required effective communication

between construction vessels and other commercial and recreational vessels within the Sound. In the past five years the following projects were successfully constructed: Eastchester Expansion Pipeline Project, the Cross Sound Cable, and the Flag Atlantic-1 North fiber-optic cable.

**Economic Impact on Vessel Traffic.** The Broadwater FSRU location and surrounding safety and security zone will be identified on marine navigational charts and illuminated at night, and the FSRU safety and security zone will be marked by buoys. The footprint of the FSRU and the recommended safety and security zone is not large enough to result in an economic impact based on the potential interruption or delay of transiting vessels. While some transiting vessels may need to navigate around this location, there is sufficient room within the established shipping routes to easily accommodate these changes without imposing additional operational costs on commercial vessel operators. Historically, commercial vessels and navigators have become familiar with noteworthy parts of Long Island Sound (e.g., Stratford Shoal and the Race) and have adjusted their operations accordingly without incurring any disruptions to economic activity.

Furthermore, as the Long Island Sound Waterborne Transportation Plan indicates, most waterborne freight consists of heavy bulk commodities that are not time sensitive or tied to just-in-time inventory schedules, as the freight mostly serves service sectors of the regional economy, and not manufacturing. This fact suggests that the possibility of any minor delays to shipping traffic resulting from FSRU operations would not have a negative economic impact on these sectors.

It is reasonable to expect that, once Broadwater operations commence, navigators would become familiar with the Project footprint and adjust their behavior to work with and around this site location. The east-to-west and west-to-east commercial freight traffic has adapted to north-to-south and south-to-north ferry transits without any interruptions to economic activity. Similarly, the LNG vessel transits to and from the FSRU would be incorporated into existing commercial vessel flow patterns without incurring any impacts on economic activity.

Furthermore, the scheduling of LNG carrier arrivals will take into account the use of the area by other marine traffic and will require close cooperation between Broadwater, the U.S. Coast Guard, and other operators to ensure impacts on other users of the Sound are avoided

or minimized.

### **1.2.8 Recreation and Tourism**

Recreation and tourism are important segments of the economies of both Suffolk County and the Long Island, especially in the more rural eastern portion of the County and Long Island. In Suffolk County alone there are 986 miles of shoreline and over 70,000 acres of parkland, which makes it a valuable recreational resource. In addition, Suffolk County has 38,000 seasonal homes, which ranks it amongst the highest in that category in the country.

The major recreational uses of Long Island Sound include activities such as swimming, beach going, recreational/sportfishing, and recreational boating. Information and data were gathered on these recreational activities to determine annual economic impacts on the Long Island Sound community and to develop a determination of potential impacts resulting from the Project.

Individuals utilizing Long Island Sound for recreational purposes are either residents of the surrounding communities in New York and Connecticut or are tourists from outside of the area. Trends in tourist visitation to Long Island Sound were estimated based on data received on hotel stays from the Long Island Convention and Visitors Bureau and Sports Commission (LICVB). From 1999 to 2005, it was estimated that the number of hotel stays has remained essentially constant for Long Island (Nassau and Suffolk Counties). There was a slight drop in occupancy rates between these years; however, there was also an increase in over 2,000 rooms to the hotel/motel room inventory. Based solely on hotel stays, it was assumed that that tourist visitation to Long Island has remained essentially constant over the past five to six years, even though tourism as a whole over that period experienced a slowdown related to national security events.

**Recreational Spending.** The quantification of recreational spending in the Long Island Sound area will be divided into beach swimming, recreational/sportfishing, and recreational boating due to data availability and distinction between activities.

In 1992, a study of the economic impact of these three above-defined recreational activities was conducted by Dr. Altobello of the University of Connecticut – *The Economic Importance of Long Island Sound's Water Quality Dependent Activities*. The results of the study

are presented in Table E-12. The data contained in the table includes total user values, which represent the value of the resource to the actual users. Direct effects include actual spending on goods and services in the community related to recreational activities. The indirect effects represent impacts from direct recreational spending on industries throughout the region. Induced effects represent the spending impacts from affected households along the supply chain.

Since the study was conducted using 1990 dollars, the results have been inflated to 2005 dollars using the Consumer Price Index (CPI). This is the most commonly referenced study when addressing the economic impact of recreational activities in Long Island Sound and is the source of the commonly used figure of \$5.2 billion of economic impact. Using the CPI to update the 1990 impact estimate to current price levels, it was estimated that the economic impact from these recreational activities on Long Island Sound is now valued at \$7.1 billion. This procedure is used by the Bureau of Labor Statistics (BLS) for rough estimating purposes and is based on assuming similar participation levels among residents and tourists (BLS 2006).

The three major recreational activities are further defined and discussed in the sections below, and additional studies are used to outline the economic impacts and the potential effects of the Broadwater Project on this resource.

**Beach Swimming.** Beach visitation and beach swimming result in a variety of economic impacts on the local community through retail purchases, food and beverage purchases, accommodations, and miscellaneous trip expenses (e.g., gas, tolls, etc.). As presented in Table E-12, the total economic impact of beach swimming in Connecticut and New York was \$622.2 million and \$514.61 million respectively. This equates to a total impact of \$1,136.81 million for the Long Island Sound area in 2005 dollars. The only adjustment made to the final results of the study was an inflation adjustment to 2005 dollars based upon the CPI.

**Table E-12 Total Recreational Values for Long Island Sound, 1990 and 2005 dollars**

	Total User Values (million \$)		Direct Effects (million \$)		Multiplier Effects (Indirect + Induced) (million \$)		Total (million \$)	
	1990	2005	1990	2005	1990	2005	1990	2005
<b>Connecticut</b>								
Beach Swimming	\$99.83	\$134.66	\$159.10	\$214.60	\$202.35	\$272.94	\$461.28	\$622.20
Sportfishing	\$11.08	\$14.95	\$258.46	\$348.62	\$366.17	\$493.91	\$635.71	\$857.48
Boating	\$56.23	\$75.85	\$836.00	\$1,127.64	\$1,003.20	\$1,353.16	\$1,895.43	\$2,556.65
<b>Connecticut Totals</b>	<b>\$167.14</b>	<b>\$225.45</b>	<b>\$1,253.56</b>	<b>\$1,690.86</b>	<b>\$1,571.72</b>	<b>\$2,120.01</b>	<b>\$2,992.42</b>	<b>\$4,036.32</b>
<b>New York</b>								
Beach Swimming	\$82.57	\$111.37	\$131.59	\$177.49	\$167.36	\$225.74	\$381.52	\$514.61
Sportfishing	\$11.13	\$15.01	\$173.09	\$233.47	\$245.22	\$330.76	\$429.44	\$579.25
Boating	\$42.33	\$57.10	\$629.31	\$848.84	\$755.17	\$1,018.61	\$1,426.81	\$1,924.55
<b>New York Totals</b>	<b>\$136.03</b>	<b>\$183.48</b>	<b>\$933.99</b>	<b>\$1,259.81</b>	<b>\$1,167.75</b>	<b>\$1,575.12</b>	<b>\$2,237.77</b>	<b>\$3,018.41</b>
<b>CT and NY Totals</b>	<b>\$303.17</b>	<b>\$408.93</b>	<b>\$2,187.55</b>	<b>\$2,950.67</b>	<b>\$2,739.47</b>	<b>\$3,695.13</b>	<b>\$5,230.19</b>	<b>\$7,054.73</b>

Source: Altobello 1992 and BLS 2006.

## Recreational Boating

Long Island Sound is a popular recreational boating area. During construction of the proposed pipeline facilities, there will be a temporary and minor loss of recreational boating area in the immediate vicinity of the active work area. Because installation will occur primarily during the winter months, when use of the Sound by recreational boaters is reduced, impacts on recreational boating are minimized. The Waterways Suitability Report confirms that in general, the majority of recreational boating occurs within 3 miles of shore. Therefore, installation of the facilities is expected to have only minor, if any, impacts on recreational boating. During operation, the proposed pipeline will have no effect on recreational boating due to its installation beneath the seafloor.

By siting the facility centrally in the Sound, impacts are minimized, and the Project will not result in significant limitations on public access to the Sound. An assessment of the potential economic impacts on recreational boating is provided below.

**Economic Impact of Recreational Boating.** The Altobello study mentioned above looked at the economic impact of recreational spending on various activities, including boating, and estimated the economic impact of recreational boating on Long Island Sound (sum of direct, indirect, and induced effects plus the user value) in 1990 as \$3.322 billion, of which the New York State portion was \$1.427 billion. Inflated to current prices, that would translate to an overall impact of \$4.481 billion in total, and \$1.925 billion for New York State (Altobello 1992).

A more recent study on recreational boating was completed for New York State in 2003 under the New York Sea Grant – *Recreational Boating Expenditures in 2003 in New York State and Their Economic Impacts*. A benefit of this study is the breakdown by geographic region; however, since it is only a state-wide study, no economic impacts are noted for Connecticut. In addition, the 2003 New York Sea Grant study indicated a much lower overall economic impact from recreational boating than the 1992 Altobello study. It estimated that the total economic impact for the New York City Long Island Metropolitan Area was \$843 million in 2003 dollars (adjusted to 2005 dollars, this would equate to \$907 million). This is only half of the \$1.925 billion impact that was estimated in the 1992 study.

Table E-13 is a breakdown of trip expenditures by geographic area in downstate



New York, which may be more representative of actual spending in Long Island Sound. The mean expenditure per boater, per trip in Long Island Sound was \$3,112 in 2003. Adjusted for inflation, this equates to \$3,346 in 2005 dollars.

**Table E-13 Trip-Related (and Non-Trip Marina) Expenditures by Category and Per Boater for Downstate New York Regions in 2003**

Expenditure Category	New York City Area	Long Island	Suffolk County	Long Island Sound
<b>At-site expenditures</b>				
Marinas and yacht clubs	\$16,714,906	\$41,213,188	\$33,417,610	\$19,961,521
Gas stations	\$6,047,504	\$21,520,880	\$15,064,446	\$7,733,943
Restaurants and bars	\$3,271,601	\$16,527,473	\$13,314,000	\$5,685,824
Grocery and convenience type stores	\$1,526,747	\$7,595,605	\$5,887,865	\$2,537,222
Bait and tackle shops	\$1,725,026	\$8,017,583	\$5,251,339	\$2,904,050
Boat launching and mooring fees	\$1,447,435	\$8,439,561	\$6,524,390	\$4,126,807
Lodging	\$575,099	\$1,898,901	\$1,909,578	\$1,467,309
Entertainment and all other expenses	\$2,756,076	\$2,602,198	\$2,386,972	\$1,161,620
All other retail purchases	\$396,558	\$4,430,769	\$3,766,112	\$1,772,999
Tournament fees	\$237,935	\$1,406,593	\$1,220,008	\$213,983
<b>At-site non-trip expenditures</b>				
Marinas and yacht clubs*	NA	NA	NA	\$43,928,160
<b>Total At-Site Expenditures</b>	<b>\$34,698,796</b>	<b>\$113,652,750</b>	<b>\$88,742,319</b>	<b>\$91,493,437</b>
<b>En Route Expenditures</b>	<b>\$5,650,947</b>	<b>\$7,806,594</b>	<b>\$5,622,645</b>	<b>\$3,637,704</b>
<b>Total Expenditures</b>	<b>\$40,349,743</b>	<b>\$121,459,343</b>	<b>\$94,364,964</b>	<b>\$95,131,141</b>
<b>Number of Boaters</b>	<b>19,828</b>	<b>70,330</b>	<b>53,044</b>	<b>30,569</b>
<b>Mean Expenditure per Boater</b>	<b>\$2,035</b>	<b>\$1,727</b>	<b>\$1,779</b>	<b>\$3,112</b>

Source: Connelly et al. 2004.

\* At-site, non-trip expenditures were only tracked for specific bodies of water and would include such expenditures as annual slip or mooring rental fee, haul-out, winterization, etc.

IMPLAN software was utilized in the 2003 New York State Sea Grant study to estimate the indirect and induced impacts of recreational boating. In Table E-14, the total output and total value added impacts are presented for Long Island Sound in both 2003 and adjusted 2005 dollars. Total output represents the value of industrial output or total sales in the regional economy. Value added represents the sum of employee compensation, proprietor income, other

property income and indirect business taxes.

**Table E-14 Long Island Sound - Output and Total Value Added Impacts of Regional Boating Expenditures (trip plus marina non-trip-related) on Regions Surrounding Specific Water Bodies (2003 dollars)**

Impact/ Water Body	Direct	Indirect	Induced	Total
<b>Output</b>				
Long Island Sound (2003 dollars)	\$76,875,779	\$22,716,685	\$22,816,209	\$122,405,674
Long Island Sound (2005 dollars)	\$82,666,725	\$24,427,901	\$24,534,922	\$131,626,324
<b>Total Value Added</b>				
Long Island Sound (2003 dollars)	\$46,263,142	\$15,114,438	\$14,377,713	\$74,755,295
Long Island Sound (2005 dollars)	\$49,748,080	\$16,252,988	\$15,460,766	\$80,386,508

Source: Connelly et al. 2004.

Despite the difference in the overall total economic impact of recreational boating estimated by the two studies presented, it is apparent that this recreational activity results in major spending locally on boating trips, for supplies, equipment, food, services, and maintenance.

### **Recreational/Sportfishing**

Charter boat companies and private individuals use Long Island Sound as a recreational fishing area. Important recreational fisheries include flounder, bluefish, scup (porgies), striped bass, tautog (blackfish), and weakfish. Broadwater undertook a fishermen's outreach program for the proposed Project in order to identify interested parties that utilize the Sound for commercial and recreational fishing and to identify those that may be impacted by the Project. Information obtained from commercial and recreational fishermen through a telephone survey included: areas fished in Long Island Sound, targeted species, gear type, seasons fished, and concerns related to the proposed Project. The outreach program also included a review of available information related to catch.

The Marine Recreational Fishery Statistics Survey (MRFSS) indicated that an estimated 464,997 marine anglers made 1,537,899 trips in 2003 (CTDEP 2004). The three principal modes of recreational marine fishing included: fishing from shore (40%), fishing from privately owned or rental boats (56%), and fishing from party and charter boats (4%). Scup was

the most frequently creeled fish, followed by bluefish, summer flounder, tautog, and striped bass. These five species comprised approximately 94% of the total creeled catch.

The MRFSS was developed to provide government agencies, scientists, and the public with reliable estimates of the recreational fishery harvest as far back as 1979. The NOAA Fisheries database was queried for 2003 recreational landings in inland waters of Connecticut and New York, which are defined as “inshore saltwater and brackish water bodies such as bays, estuaries, sounds, etc.”

According to the MRFSS, recreational landings from New York and Connecticut exceeded 15 million pounds (6.8 million kg) during 2003. Bluefish, scup (porgies), striped bass, and summer flounder account for the vast majority of the landings in both states. While the top species harvested in Connecticut according to NOAA Fisheries are consistent with those reported by CTDEP (2004), the total landings are more than twice those reported by CTDEP (2004). One possible reason for this discrepancy is that while CTDEP (2004) relies on only an intercept survey to estimate total landings, NOAA Fisheries relies on that same intercept survey as well as a telephone survey.

**Economic Impact of Sportfishing.** The two sources used to determine the economic impact of sportfishing in Long Island Sound were the 1992 study from the University of Connecticut and a 2001 New York State Sea Grant report – *The Economic Contribution of the Sport Fishing, Commercial Fishing, and Seafood Industries to New York State*. Together these form the framework for assessing the economic impact of sportfishing.

According to the Altobello study (*see* Table E-12), the specific annual economic impact of sportfishing, inflated to 2005 dollars, in Long Island Sound on New York and Connecticut was \$579.25 and \$857.48 million, respectively, for a total of \$1,436.73 million. The benefit of this study is the examination of impacts on both Connecticut and New York State; however, it fails to look at trends and specific spending characteristics of marine anglers (Altobello 1992).

The following tables from the 2001 New York State Sea Grant study present more detailed information on marine (saltwater) fishing characteristics and trends in New York State. Table E-15 presents two years of data on marine angler participation. After a peak in 1994, the



total number of anglers has declined annually (Techlaw 2001).

**Table E-15 New York State Marine Anglers, 1996 and 1998**

Number of Anglers	Activity in New York State					
	Total		New York Residents		Non-Residents	
	Number	Percent	Number	Percent	Number	Percent
1996	539,540	100	501,130	92.9	38,410	7.1
1998	475,720	100	433,226	91.1	42,494	8.9

Source: Techlaw 2001.

An important indicator of sportfishing expenditures is the mode by which the angler is able to fish. Many individuals fish from shore, while others own boats, rent boats, fish from party boats, or charter boats from fishing guides. Table E-16 presents the total number of trips and mode by fishing area. It should be noted that Long Island Sound is considered an inland water body with respect to this study (*see* note in Table E-16). The most popular type of fishing area is inland waterway (which includes Long Island Sound), and the most popular mode of fishing for each fishing area is from a privately owned or rented boat.

**Table E-16 New York State - Numbers of Trips by Mode and Fishing Area, 1998**

Mode	Inland <sup>1</sup>	Percent	Ocean		Ocean		Total
			<=3 miles	Percent	>3 miles	Percent	
Shore	1,043,064	36.0	131,686	30.5	NA	0	1,174,750
Party/Charter <sup>2</sup>	163,394	5.7	106,071	24.6	25,431	16.3	294,896
Private/Rental	1,687,595	58.3	194,141	44.9	130,342	83.7	2,012,078
Total	2,894,053	100	431,898	100	155,773	100	3,481,724

Source: Techlaw 2001.

Notes: NA = not applicable.

<sup>1</sup> Other bodies of saltwater besides the ocean; sounds, inlets, tidal portions of rivers, bays, and estuaries.

<sup>2</sup> Party boats conduct daily, scheduled trips and provide anglers with the ability to go fishing without advanced planning. There is a fee that covers their fishing needs. Party boat vessels carry 30 or more passengers. Charter boats carry passengers who have pre-arranged fishing trips for certain species. Fees are based on species to be fished and distance. Charter boats carry six to eight passengers, although some carry more.

Specific data that summarizes employment in the fishing industry has not been collected. However, sportfishing employment can be estimated by using U.S. Census sales per

employee data for the services and retail businesses that make up the sportfishing industry. Using this method, it is estimated that the employment impact in the sportfishing industry is over 17,000 jobs. These jobs are a mix of full- and part-time positions (Techlaw 2001).

### **Boating Surveys**

To supplement and expand on literature research and interviews with local resources, Broadwater performed a boat traffic survey in the summer of 2005 to observe commercial and recreational boat traffic patterns in the vicinity of the proposed Project (*see* Appendix B). Based on the results of the survey, Broadwater assessed the potential impacts resulting from construction and operation of the FSRU and pipeline on commercial and recreational boating activities in Long Island Sound.

The objective of the boat survey was to quantify boat use in the area of the proposed Project during holiday weekends and other high-use days during the summer to observe the maximum boat traffic near the proposed FSRU location and along the proposed pipeline route. High-use days included days where sailing regattas and excellent weather coincided, which often overlapped with holiday weekends. For major findings of the boat traffic survey, refer to the separate report entitled Boat Traffic Survey (*see* Appendix I).

### **Potential Marine Use Compatibility Issues**

**Potential Economic Impact from the Broadwater Project.** When examined based upon the three major recreational activities outlined in this section, the potential economic impact from the Broadwater Project has varying results due to the nature of activity. Swimming and beach visitation are not expected to be impacted as a result of the Broadwater Project due to the inherent distance of these activities from the proposed FSRU location. However, boating and fishing activities could take place closer to the FSRU and the surrounding safety and security zone during Project operations and, thus, could be negatively impacted. These recreational activities and estimated impacts are discussed individually below.

**Beach Swimming.** Beach visitation and swimming are activities confined, by definition, to coastal areas with beaches. The closest coastline to the proposed location of the Broadwater Project is 9 miles away and does not inhibit or alter the ability of residents or tourists

from participating in beach-going activities or swimming. As a result, it is estimated that the Broadwater Project will have no impact on this recreational activity or its associated economic impact on the Long Island Sound area. Observations from other coastal communities around the U.S. show that beach attendance has not been affected in any material way by compatible industrial and commercial marine activities. For instance, beach users in South Florida are accustomed to seeing large cargo and freight vessels transit the coastline within their activity viewsheds. These economic activities have not detracted from the recreational experience or beach attendance, as revealed in hotel occupancy data figures.

There may be some perceived adverse impact associated with the view, depending on weather, of the FSRU in the Sound when either swimming or at a beach. However, this potential impact is discussed in Resource Report No. 8, Land Use, Recreation, and Aesthetics, which is incorporated by reference herein, and is not assumed to have a negative economic impact with respect to this recreational activity.

**Recreational Boating.** As discussed previously, recreational boating on Long Island Sound is a significant economic driver and results in several billion dollars in total economic impact annually. The Boat Traffic Survey conducted as part of Resource Report No. 8, Land Use, Recreation, and Aesthetics, outlines the approximate boating activity in the vicinity of the Project site during several of the busiest boating days of the year. Beyond short-term impacts associated with construction-related activities, there are expected to be no impacts associated with the proposed pipeline since it is on the seafloor.

Data from the Boat Traffic Survey was used to analyze the economic impact on recreational boating. The survey found that 2.1 boats per survey hour came within 0.6 mile of the proposed FSRU location. According to the 2001 New York State Sea Grant study, the mean expenditure per boater was \$3,346 in 2005 dollars. Since the Boat Traffic Survey was performed during the busiest boating days of the year, it is assumed that one boat per hour is an appropriate figure, using 10-hour days and a 6-month (May to October) recreational boating season. This equates to 1,840 total boats (1 boat per hour x 10 hours of boating time per day x 6 months of boating season) that would approach the proposed FSRU annually. When the average expenditure per boater is applied to this boating estimate, a total direct economic impact of

\$6,156,640 is obtained. When measured against a total expenditure for Long Island Sound of \$102,297,238 (according to Table 4-4, inflated to 2005 dollars), the potential loss in expenditures equals 6%. However, this assumes that all boaters on a course that would take them in the vicinity of the proposed FSRU would not boat and would expend absolutely no money on boating activities, whereas the far more likely scenario is that they would choose to avoid the area of the proposed FRSU through prior trip planning or small course adjustments, and the overall economic impact would be minimal.

**Impact of Recommended Safety and Security Zone.** The recommended safety and security zone sensitivity analysis assesses a buffer of 1,210 yards. This equates to approximately 950 acres.

As reported by the Long Island Sound Study (LISS) in 2006, there are approximately 844,800 total acres in Long Island Sound (LISS 2006). Assuming 20% of this total area is removed because it is not suitable for recreational boating due to the proximity to shore, depth of water, or other obstructions, 675,840 acres of adequate boating water still remains. Table E-17 compares the percent total of the recommended safety and security zone with the total adequate boating area of Long Island Sound.

**Table E-17 Percentage of Navigable Water in Long Island Sound**

Recommended Security Zone	Acres in Zone	% of Total Long Island Sound
1,210-yard buffer	949.7	0.11%

The safety and security zone ocean area that would potentially be off limits to recreational boating represents a minute portion of the total usable navigable water in Long Island Sound; and the region gains a valuable resource – natural gas.

Other than sailing in regattas, recreational boaters typically do not follow a specific course and would be able to alter their heading to avoid the FSRU and any established safety and security zone without significantly or adversely impacting their trip.

Some recreational boaters may choose to avoid the area surrounding the FSRU completely. Due to the location of the proposed FSRU site in the middle of Long Island Sound



and the closest coast being approximately 9 miles away, it is assumed that recreational boaters who would prefer to avoid the FSRU have the ability to do so, i.e., the FSRU is not located directly offshore from a port where recreational boaters would have no choice but to pass close to the FSRU and the safety and security zone.

The number of recreational boaters that would choose to not boat on Long Island Sound due to the presence of the Broadwater Project, who would either move to another body of water or not boat at all, is assumed to be minimal and would not have a significant impact on the overall established current economic impact.

**Recreational Sportfishing.** As discussed above, the proposed FSRU and the associated safety and security zone would occupy only a small portion of Long Island Sound. Table E-17 presents a breakdown, in acres, of Long Island Sound waters that would no longer be accessible to anglers for sportfishing.

Sportfishing participation rates have been decreasing since 1994 according to the 2001 New York State Sea Grant study. With this decrease in the overall number of anglers, the conclusion could be drawn that there has been an overall decrease in competition for fishing areas in Long Island Sound. Thus, sportfishermen would likely be able to find adequate fishing locations in Long Island Sound outside of the safety and security zone that would be associated with the FSRU.

The Stratford Shoal area, which is a popular fishing location and has high fisherman boat traffic, as noted in the Boat Traffic Survey, is approximately 12 miles away from the proposed FSRU location. There would be no conflict between the proposed Project and sportfishing in the Stratford Shoal area.

### **Long Island Tourism**

Information on Long Island Sound based recreational activity was covered in previous sections. This section provides additional background information and economic data related to the tourism industries that support both offshore and land based recreational activities and attractions for out of town visitors.

The tourism "industry" can be comprised of firms that fall mostly within the retail

trade sectors. Environmental and natural resource based amenities on Long Island serve to attract visitors from outside the region who then spend money on goods and services within Suffolk and Nassau Counties. The tourism spending is amplified by overnight stays and attractions and visits that require overnight lengths of stays.

The region possesses a tourist infrastructure comprised of hotels/motels/bed & breakfasts and Inn and restaurants and other support services that cater to tourists. An area's historic character or market "branding" can define the resources that attract tourists. Out of town visitors bring in new or imported dollars to a region and their spending contributes to economic growth in a region and supports other dependent industries and households. Eastern Long Island has always attracted visitors from the NYC metro area who view the less developed parts of the Island as a weekend or even day retreat or getaway destination.

Industrial and commercial activities that are considered low impact or benign serve to leave the region's particular "brand" untarnished. This is because these activities are not located in high profile areas that serve to attract out of town visitors.

### **Background Activity**

It is estimated that the 20 New York State-managed parks and historic sites (along with other locally run municipal parks) on Long Island attract nearly 20 million visitors annually. Many of these sites are located in Nassau County, close to New York City, or on the far eastern end of Long Island (New York State Office of Parks 2006). The attractions on Long Island are the coastal areas and bays for swimming, fishing, boating and other beach recreational activities, in addition to golf destinations, wine tours, inland hiking, biking and camping, and general sightseeing tours.

Specific popular attractions in Suffolk County, NY include the Vanderbilt Museum, Walt Whitman Historic Site and the Stony Brook Grist Mill in the "North Shore" area. Central Suffolk attractions include a top-rated water park, Splish Splash, and the Atlantis Marine World aquarium in Riverhead, NY. In eastern Long Island, the two "forks" each offer unique attractions. North Fork is more rural, with vineyards, farm stands and smaller villages. South Fork is the location of the more exclusive Hamptons, which includes upscale dining and shopping (LICVB 2006).

The Long Island wine industry is a growing tourist destination which has received significant attention and funds over the past decade. There are 38 licensed wine producers on Long Island, 33 of which are located on the North Fork (30 on LI and 26 on North Fork are open to the public). It is estimated that there are approximately 500,000 visitors to the East End wineries annually (Long Island Wine Country 2006).

Access to Long Island can also be gained through use of buses, trains, ferries or personal vehicles or plane. Airports generally serving tourists coming to Long Island include the following:

JFK International Airport	LaGuardia Airport
Brookhaven Airport	Republic Airport Farmingdale
Lufker Airport East Moriches	East Hampton Airport
Islip Airport	Mattituck Airport
Francis S. Gabreski Airport Westhampton	Montauk Airport
Long Island MacArthur Airport	

Source: Long Island Browser 2006.

Tourism-related employment figures for New York State and Long Island (Nassau and Suffolk Counties) are presented in Table E-18. As indicated in the table notes, the tourism-related employment data is estimated from a "Travel & Tourism Cluster" of industries, which are then prorated based on assumptions of purchases and spending directly related to tourists (not residents). Thus, the figure of 38,130 pro-rated 2004 Long Island employment is representative of jobs that cater directly to non-resident, out-of-town tourists visiting local attractions.

**Table E-18 Tourism Related Employment and Wages for New York State and Long Island (2004)**

	Pro-Rated Employment	Pro-Rated Total Wages	Average Wages
New York State	333,530	\$10,818,540	\$32,400
Long Island	38,130	\$1,105,120	\$29,000
Nassau	19,380	\$581,191	\$30,000
Suffolk	18,750	\$523,930	\$27,900

Source: N.Y. State Dept. of Labor 2006.

Notes:

1. ESD counts 70 6-digit NAICS-based industries as part of the Travel & Tourism Cluster; this industry list is further broken down into 5 sub-clusters including: 1) Travel Retail; 2) Passenger Transportation; 3) Culture, Recreation and Amusements; 4) Accommodations; and 5) Food Services.
2. As it has for the past few years, ESD pro-rates industry employment and wages data by only counting that share of employment and wages in an industry attributable to purchases made by tourists. Share estimates were developed by the BEA (For example, according to the BEA, approximately 20 percent of all food and beverage purchases are made by visitors, while the remaining 80 percent are made by local residents.)
3. Pro-rated County and regional travel & tourism employment and wages data for 2004 are attached. Also included is a list of tourism industries and their respective pro-ratio shares.

Although tourism is a major industry in Long Island, generating an estimated \$65 million in annual sales, it is not a major source of employment in Nassau and Suffolk Counties.

### **Potential Economic Impact from the Broadwater Project**

Negative impact to historic tourism levels and associated spending from the proposed Project is not expected. The Project will not affect the Long Island area's natural resources and amenities that serve to attract tourists. The Project will be sited at a significant distance from any coastal areas that would attract tourism. In addition, land based activities to support Broadwater will be small and low impact in scope. Because no adverse impact is expected, the Project is not expected to have any effect on the regional "branding" that defines the tourist experience on Long Island. The level of spending that is derived from tourism is expected to be unimpeded by the Project.

It would take a significant, protracted change in commercial and industrial activity and development to affect the particular "brand" that defines Eastern Long Island. Open spaces and access to water are amenities that "brand" this part of Long Island.

The marketing appeal and branding for a sub-area such as a wine country area will not be impacted by offshore commerce. In addition, ecologically fragile areas that function as regional eco-tourist attractions such as the North Fork and the Pine Barrens (*see* Figure 1-8 for geographic reference) would not be impacted by the Project. As long as the resources that attract tourism remain intact, the tourist based economic sectors that depend on this visitation will not be impacted.

## **2.0 ONSHORE LAND USE**

Broadwater has identified two onshore locations on Long Island that can provide the facilities needed to support the operation of the Project: a waterfront site in the Village of Greenport, and a waterfront site in the Village of Port Jefferson (*see* Figures 2-1 and 2-2). The Village of Greenport is located in the Town of Southold, on the North Fork of Long Island, and Port Jefferson is located in the Town of Brookhaven, on the north shore of Long Island. The permanent onshore facilities will include land required for office space, warehousing, and a waterfront facility. Broadwater expects to lease all onshore facility space; no fee simple land acquisition is proposed.

### **2.1 Port Jefferson**

The existing waterfront and docking facilities located at the proposed Port Jefferson site are adequate to address the needs for temporary facilities related to construction of the Project. As such, no new additional facilities will be constructed and, therefore, no related environmental impacts or conflicts are anticipated.

#### **2.1.1 Land Use**

Port Jefferson's waterfront area is also known as its downtown. This area is comprised of a mix of land uses, including waterfront, industry, commercial, residential, and government (*see* Figure 2-3). The Village has developed over recent years and has begun to take on a tourist center character, revolving around the Port Jefferson ferry terminal, restaurants, and shopping centers. According to the Port Jefferson Harbor Complex Harbor Management Plan (HMP) (Village of Port Jefferson 1999), there has been a slow transition of Port Jefferson Harbor from a mostly industrial waterfront to one characterized by a mix of land uses, including recreational, commercial, industrial, and residential, which has resulted in conflicts and congestion within the harbor. Despite this, however, the proposed usage of properties by Broadwater for Project-related activities is allowable and encouraged under the Village's and Town's planning documents (Village of Port Jefferson 1999) and will be consistent and compatible with existing land use patterns in the area.

### **2.1.2 Zoning**

The Port Jefferson site is currently zoned primarily as M-W (Marina Waterfront) (see Figure 2-4). The M-W zoning designation allows for land uses that support water-dependent uses such as marinas and docks. Other surrounding zoning includes C-G (General Commercial) to the south and R-2 (One- and Two-Family Residential) to the west and east (Suffolk County Planning Department 1997). Therefore, the facilities proposed in support of the Project will be consistent with existing zoning.

### **2.1.3 Coastal Zone Management**

The proposed site for permanent Project facilities in Port Jefferson is located within the Long Island Sound Coastal Zone Management Area. According to the NYSDOS, Port Jefferson does not have an approved Local Waterfront Revitalization Program (LWRP) (Saske 2005). Port Jefferson does have a current HMP, which is maintained by local municipalities bordering the harbor complex. The Port Jefferson HMP provides a comprehensive environmental, ecological and natural resources evaluation of the harbor and identifies existing sources of impacts on sensitive harbor resources. The HMP is also used as a planning tool for the bordering municipalities to guide future development within the HMP area. Port Jefferson's HMP also provides information on land use and ecological resources in the planning area. Although the majority of the proposed site consists of marine commercial/industrial shoreline type parcels, sensitive ecological resources include large bluffs occurring in various locations adjacent to Port Jefferson Harbor shoreline and adjacent to portions of the Project area.

The Port Jefferson HMP also states that because the amount of commercial waterfront is limited and concentrated in specific areas, priority for development should be given to water-dependent and water enhanced uses in these areas in order to provide the greatest economic benefits. In the Harbor Issues and Recommendations section of the HMP, Harbor Objective No. 1 states that the existing uses in lower Port Jefferson Harbor (in the area of the proposed Broadwater onshore facility), such as "boatyard dockage facilities, transshipment and oil transfer facilities, and marinas," are of "vital importance to the economic vitality and historic character of the Village of Port Jefferson and should be enhanced," in a manner consistent with the protection of natural resources in the area spanning Port Jefferson Harbor. The proposed use



of onshore facilities in this location by Broadwater will be consistent and compatible with this key recommendation as stipulated in the Port Jefferson HMP.

## **2.2 Greenport**

Permanent onshore facilities such as office space, warehousing, and a waterfront facility are required at the Greenport site. Leasing of all needed onshore facility space is anticipated; no land acquisition is proposed at Greenport. The intended use of the facilities for these purposes is expected to be the same as their current use, as discussed below. Therefore, no related environmental impacts or conflicts are anticipated at the Greenport site.

### **2.2.1 Land Use**

The specific parcels proposed for permanent facilities in Greenport fall within areas designated as Waterfront Area 1 and Waterfront Area 2, which include the following mix of land uses: marine commercial (9.2 acres [56.9%]), vacant disturbed abandoned (2.8 acres [17.2 %]), institutional (0.39 acres [2.4%]), and commercial (3.8 acres [23.5%]) (*see* Figure 2-5). The surrounding uses include commercial and marine commercial to the north, village residential to the west and south, and open water (Greenport Harbor) to the east (U.S. Office of Ocean and Coastal Resource Management 1996). In addition, the proposed onshore facilities are located in an area designated as marine commercial under the Village of Greenport's future land use map. According to the Village of Greenport's LWRP, marine commercial uses in Waterfront Areas 1 and 2 currently include a variety of water-dependent businesses and activities, including but not limited to: retail and wholesale seafood product manufacturers; facilities for offloading fish from commercial vessels; dockage for transient vessels; and marine supply facilities (U.S. Office of Ocean and Coastal Resource Management 1996). Based on the existing usage within Greenport's Waterfront Areas 1 and 2, the proposed Project-related activities are expected to be consistent and compatible with existing land use patterns in the area.

### **2.2.2 Zoning**

Currently, the Greenport site is primarily zoned W-C (Waterfront Commercial), with a small portion being zoned C-R (Retail Commercial) (*see* Figure 2-6). Other zoning designations adjacent to the proposed site include R-A and R-B2 (Residential) to the east and west, and C-1 (Central Commercial) to the south. The W-C zoning designation allows for uses

supporting water-dependent uses such as marinas and docks. Therefore, the facilities proposed in support of the Project will be consistent with existing zoning (U.S. Office of Ocean and Coastal Resource Management 1996).

### **2.2.3 Coastal Zone Management**

The proposed site for Project facilities in the Village of Greenport is located within the Long Island Sound Coastal Zone Management Area, as well as within the boundaries of the Village of Greenport's state and federally approved LWRP. The goals of the Greenport LWRP are to protect and maintain water-dependent uses, revitalize underutilized waterfront areas, strengthen Greenport as a commercial fishing seaport, provide for public access to the waterfront, and enhance the village as a commercial and business center (U.S. Office of Ocean and Coastal Resource Management 1996). Because the proposed Project waterfront facilities will be used for the marine transfer of people, equipment, and FSRU support vessels, the use is a water-dependent use consistent with the Greenport LWRP.

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## **APPENDIX F**

# **COMMERCIAL FISHERIES, RECREATION, AND LONG ISLAND SOUND DEPENDENT COMMERCIAL ACTIVITIES - AN ECONOMIC ANALYSIS**

**REVISED  
October 2006**



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BLS	Bureau of Labor Statistics
Completion Report	“Fishery Dependent Monitoring of the American Lobster Off the East End and South Shore of Long Island, NY, for the period July 1, 2002 through June 30, 2003”
CPI	Consumer Price Index
CTDEP	Connecticut Department of Environmental Protection
EE	East End of Long Island
E & E	Ecology and Environment, Inc.
ELIS	Eastern Long Island Sound
FSRU	floating storage and regasification unit
IMPLAN	Impact Analysis for Planning
LICVB	Long Island Convention & Visitors Bureau and Sports Commission
LIS	Long Island Sound or Sound
LISWTP	Long Island Sound Waterborne Transportation Plan
LNG	liquefied natural gas
MIG	Minnesota IMPLAN Group, Inc.
NMFS	NOAA National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NYSDEC	New York State Department of Environmental Conservation
SS	South Shore
WLIS	Western Long Island Sound

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## **1.0 INTRODUCTION**

The analyses contained in this report responds to supplemental questions on how the proposed Project will potentially impact key Long Island Sound (Sound or LIS) coastal zone resources from an economic perspective. The analyses use information contained in several Broadwater Resource Reports as well as newly-acquired materials to estimate economic impacts associated with commercial fisheries (lobster), recreation, and LIS-based navigation dependent industries as well as the finding of the U.S. Coast Guard set forth in the Waterways Suitability Report (WSR).



## **2.0 COMMERCIAL FISHERIES – LOBSTERS**

This section collates and summarizes select officially compiled data that describes the historical evolution of the Long Island Sound based commercial lobster fishing industry. The data assembled reflects important trends that are considered and used in developing an impact estimate attributable to the loss of access to an area of the Sound used for lobster fishing as a result of the U.S. Coast Guard-recommended 1,210 yard safety and security zone for the floating storage and regasification unit (FSRU).

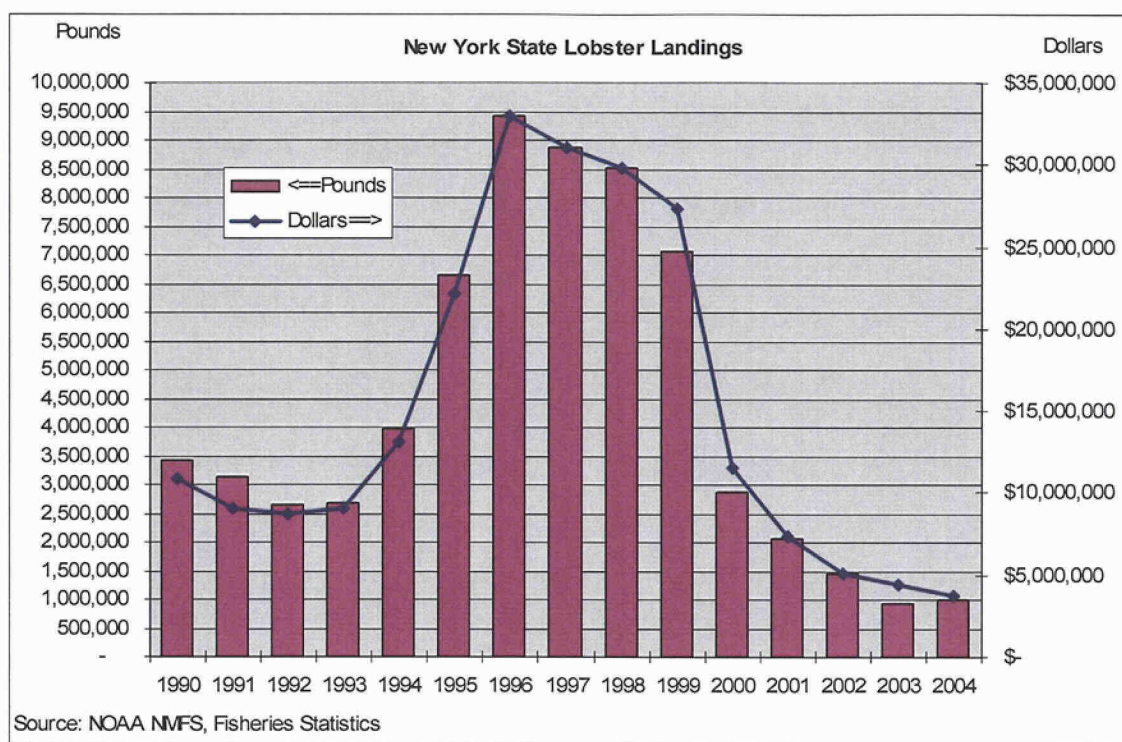
### **2.1 Background Historical Market Context and Key Recent Trends**

#### **2.1.1 NOAA Fisheries Statistics for New York State**

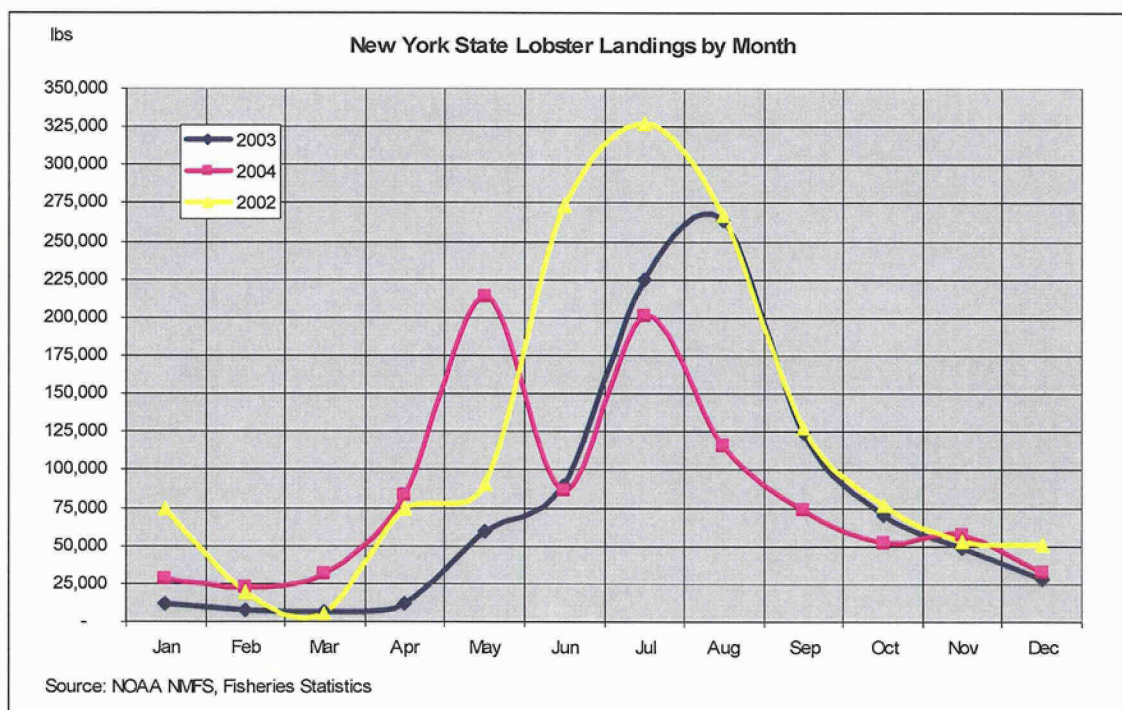
Most of the lobster caught by the New York lobster industry is in Long Island Sound. The New York State Department of Environmental Conservation's (NYSDEC) most recent data show that about 82% of all New York commercial landings are from the Sound (NYSDEC, 2004). Historically, the share attributable to Sound landings has been above 90%. The following exhibits and tables describe available data and information compiled from the NOAA National Marine Fisheries Service (NMFS) Fisheries Statistics dataset and data from the NYSDEC's Fishery Dependent Monitoring sampling program for the American Lobster off the East End and South Shores of Long Island, NY.

Figure 2-1 plots the annual pounds of commercial lobster landings and values for New York State since 1990. In 1996, the dockside value of lobster landings reached almost \$33 million, reflecting landings of 9.4 million pounds. Most recently, for 2004, the total pounds landed by the New York lobster fishing industry reached almost one million pounds and had a dockside value of \$3.74 million dollars. Prices per pound for the American Lobster have been trending upwards since 1990 and have averaged over \$3.5 dollars per pound in the last several years. The figures reflect the lobster mortality or die-off of 1999 and show the sharp declines in landings especially since 1999. In recent years, however, the populations appear to have stabilized according to the most recent monitoring and sampling activities (NYSDEC, 2004).

In New York, most landings occur during May through August of the year with peak production in either July or August. Figure 2-2 shows the monthly landings for New York from 2002 – 2004.



**Figure 2-1 New York State Lobster Landings**



**Figure 2-2 New York State Lobster Landings by Month**

### 2.1.2 Summary of 1999 Study on Economic Contribution of Lobster Fisheries

This section summarizes past research that estimated the total economic impact of the commercial lobster industry to NYS, based on the initial value of commercial lobster landings. The research was completed by Techlaw Inc. as part of a New York Sea Grant and was entitled, "The Economic Contribution of the Sport Fishing, Commercial Fishing and Seafood Industries to New York State" (Techlaw Inc., 2001).

This research used the same NMFS lobster landings data summarized above (1999) as inputs (the direct economic impacts) to estimate the total economic impacts to NYS. It also used a standard economic impact model, Impact Analysis for Planning (IMPLAN) that was also employed in Broadwater Resource Report No. 5, Socioeconomics. Total economic impacts take into account the spending impacts from landings revenues that cycle through the economy. The revenues (the value of lobster landings) can be spent on boats and related equipment, repairs, fishing gear, bait, ice, fuel and other expenses required to sustain commercial operations.

Table F-2-1 summarizes the results of the Techlaw study.

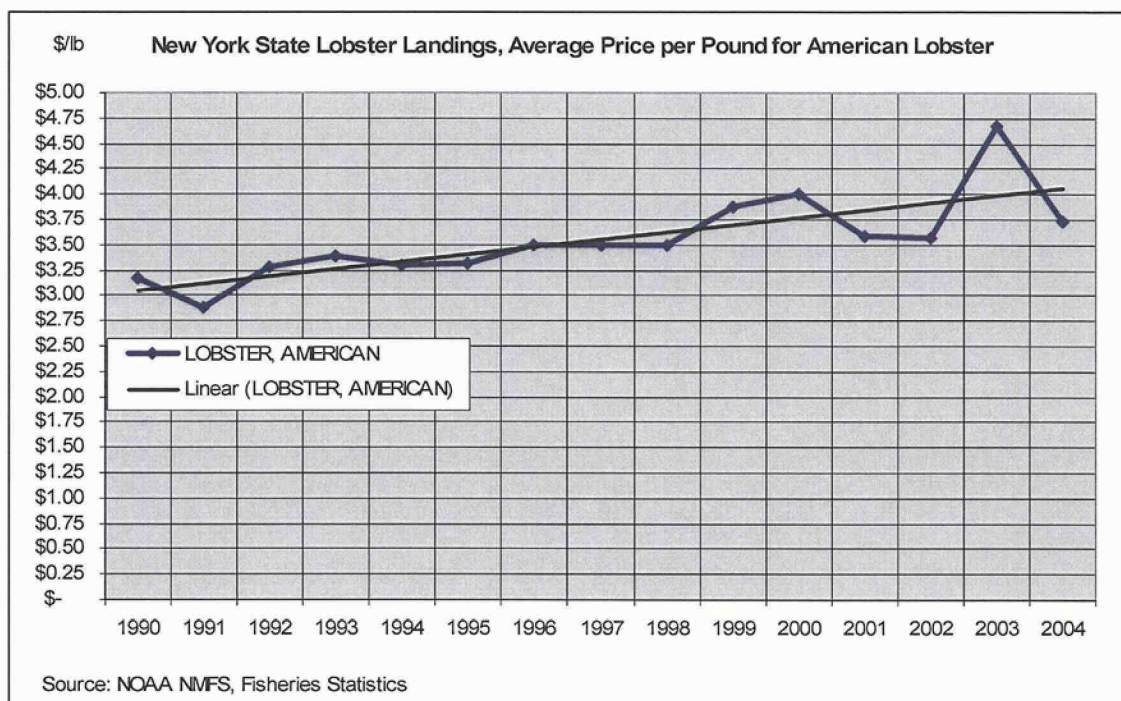
**Table F-2-1 Contribution of New York Commercial Fishing to State Economy, 1999, Dollar Value**  
(Millions of 1999 dollars)

	(1)	(2)	(3)	(4)	(5)
Commercial Fishing Species or Gear Type	1999 Value of Landings	Impact on Sales of Goods and Services	Total Contribution	Economic Impact Multiplier = [Total Contribution/Value of Landings]	Percent Breakdown of Economic Impact
1 Lobster, inshore	\$21.80	\$21.30	\$43.10	1.98	28.8%
2 Lobster, offshore	\$5.50	\$5.40	\$10.90	1.98	7.3%
3 Mollusks, shellfish	\$26.90	\$26.20	\$53.10	1.97	35.5%
4 Surf clam dredges	\$2.20	\$2.30	\$4.50	2.05	3.0%
5 Inshore fisheries	\$3.80	\$3.70	\$7.50	1.97	5.0%
6 Multi-species trawlers	\$11.60	\$10.80	\$22.40	1.93	15.0%
7 Longline	\$4.20	\$3.90	\$8.10	1.93	5.4%
8 Great Lakes	—	\$(1.00)	NA	NA	NA
9 Aquaculture	\$1.90	\$(1.00)	NA	NA	NA
10 Total commercial fishing	\$77.90	\$71.60	\$149.60	1.92	100.0%

Table F-2-1 shows the results of the economic contribution study for all commercial fisheries landings including lobster for NYS. The lobster segment is highlighted in gray. The economic impact estimates were based on the value of 1999 total lobster landings that are also portrayed in Figure 2-1 for 1999. In Figure 2-1, the line point for total lobster landings for 1999 is equal to the sum of lobster landings-in shore, (\$21.8 million), plus lobster landings-



offshore (\$5.5 million), that are broken out in Table F-2-1. The line point in Figure 2-1 for 1999 is equal to the combined value of inshore and offshore landings of \$27.3 million.



**Figure 2-3 New York State Lobster Landings, Average Price per Pound for American Lobster**

The economic impact estimate reflects catch data before the full effect of the lobster die-off had run its course. The 1999 economic impact estimates shown in Table F-2-1 were based on a population that had yet to be fully impacted by the lobster die-off. The relatively higher level of lobster landings for 1999 resulted in larger total economic impacts than would have been the case in subsequent years, when the lobster die-off impact was visible in lower landings catch figures. Total economic impacts are based on the value of lobster landings that are considered the direct effect before any multiplier is applied. The second column of Table F-2-1 reflects the indirect and induced impacts from the spending of revenues on supplies and equipment to sustain commercial operations. The total contribution column represents the total economic impact and is the sum of columns 1 plus 2. The economic impact multiplier is shown in column (4) and is the ratio of the Total Contribution (3) to the 1999 value of landings (1).

In 1999, the lobster industry accounted for 36% of the total economic impact to NYS based on landings that comprised 28% of the share of total commercial fishery landings

(see Table F-2-1). Since total economic impact estimates are proportional, Table F-2-1 can be used to estimate the total contribution from landings associated with the Sound areas that would be restricted because of the Broadwater Project's safety and security zone. However, Ecology & Environment Inc. (E & E) also applied the IMPLAN model software to the most recent lobster landings figures, so the two studies are comparable.

### 2.1.3 NYSDEC Lobster Landings Data

The NYSDEC also compiles data on commercial lobster landings in New York as part of its monitoring activities for the American Lobster species. (see "Fishery Dependent Monitoring of the American Lobster Off the East End and South Shore of Long Island, NY" [for the period July 1, 2002 through June 30, 2003]) ("Completion Report") (McKown et al. 2004). The NYSDEC data reflect similar trends to the NMFS data and also provides information about the particular sub-areas within New York and Long Island Sound for the landings and equipment deployed.

Figure 2-4 compares the NMFS data to the NYSDEC resident commercial lobster landings time series in pounds. The time series show that the declining trends in landings have stabilized or leveled off in recent years.

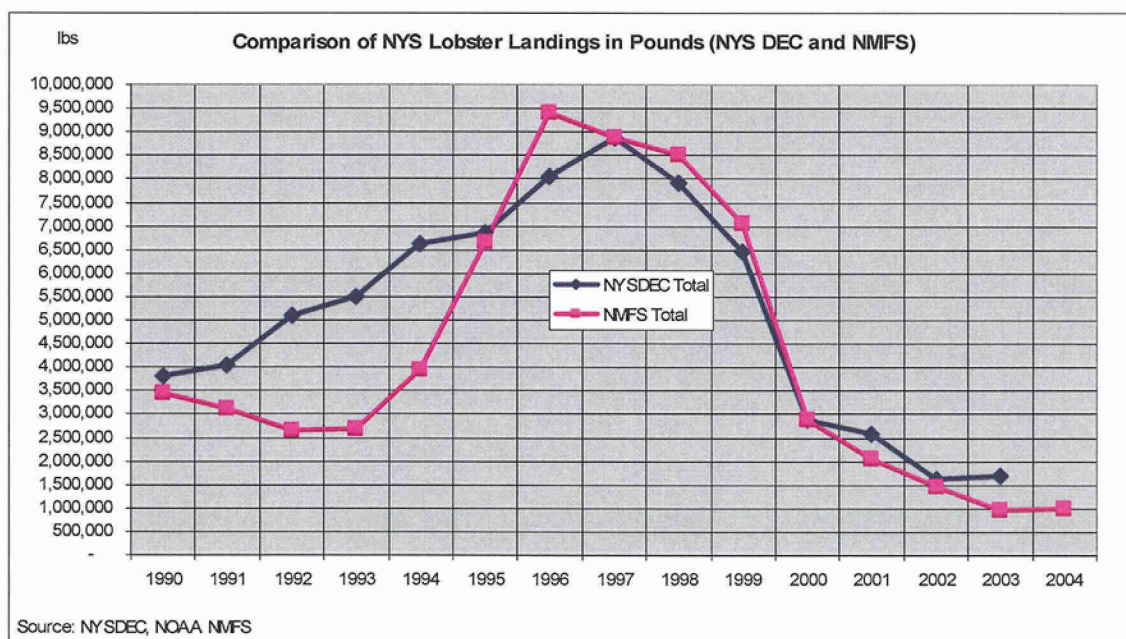


Figure 2-4 Comparison of NYS Lobster Landings in Pounds (NYSDEC and NMFS)

### 2.1.4 Long Island Sound Lobster Landings by Area

Figure 2-5 reproduces the NYSDEC Long Island Sound and Vicinity Fishing Area Chart. In reading Figure 2-5, the following legend should apply:

- WLIS = Western Long Island Sound
- ELIS = Eastern Long Island Sound
- EE = East End of Long Island
- SS < 3 = South Shore out to three miles
- SS > 3 = South Shore beyond three miles

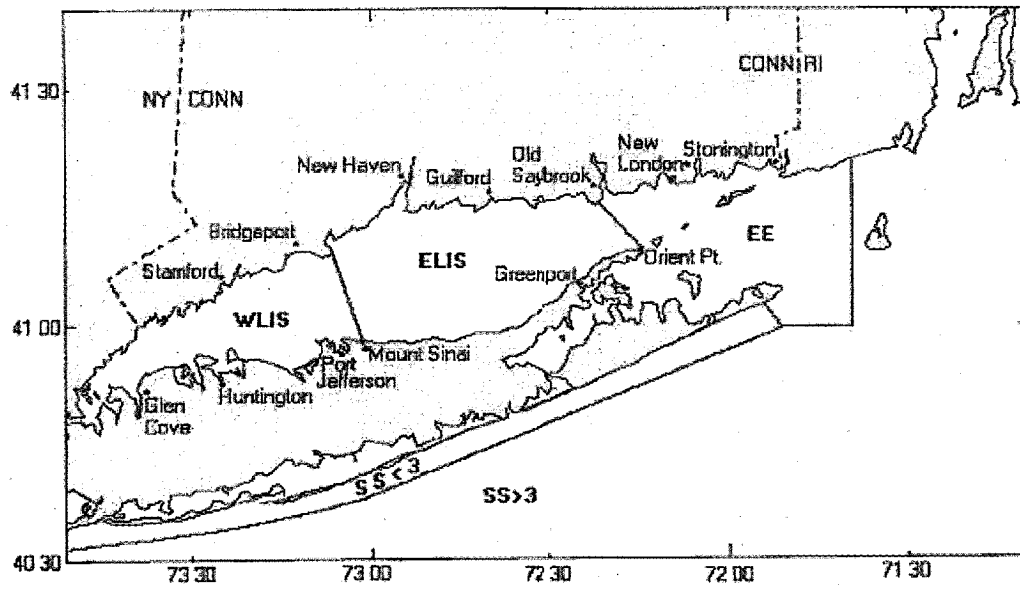
Figure 2-6 shows the shares of total NYS commercial lobster landings taken by sub-area. Activity within the Eastern LIS sub-area is most relevant, as this area would contain the Broadwater Project footprint. More detailed landings data within each sub-area is not available from the NYSDEC.

Figure 2-6 also shows the share of commercial lobster landings (as a % of NYS Total) corresponding to each sub-area within the Sound as well as the South Shore. The Western portion of the Sound was most impacted by the lobster die-off and the share of landings fell from over 50% in 1998 to about 25% in recent years. The share of landings for the Eastern LIS area is also about a quarter of all landings, but grew as high as 45% up until a few years ago. The shares of South Shore (beyond the three mile area) and East End of LIS landings have also been rising in recent years. Table F-2-2 shows the lobster landings in pounds for each sub-area within NYS.

The NYSDEC data and Completion Report does not contain any information on the value of landings. To determine the value of landings by sub-area within NYS, E & E applied the NMFS unit value data (\$/lb) by year to the relevant landings in pounds by sub-area to calculate the dock side value by sub-area corresponding to the NYSDEC data. The following figures and tables document the information that was relied upon to isolate the relative importance of the local sub-area lobster fisheries activity that would be most relevant to assessing potential impacts from the Broadwater Project.

Figure 1.

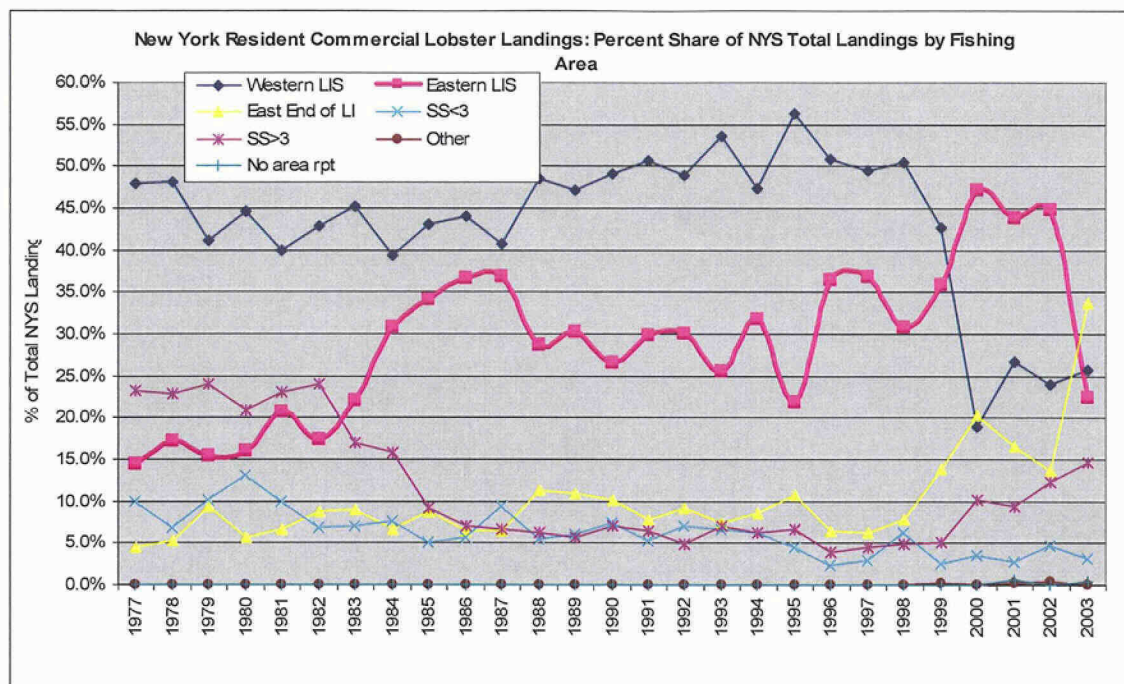
Long Island Sound and Vicinity Fishing Area Chart.



Source: NYSDEC

Figure 2-5 Long Island Sound and Vicinity Fishing Area Chart





Source: NYSDEC

**Figure 2-6 New York State Resident Commercial Lobster Landings: Percent Share of NYS Total Landings by Fishing Area**

**Table F-2-2 New York State Resident Commercial Lobster Landings (lbs) by Area from 1977-1983**

Year	Western LIS	Eastern LIS	East End of LI	SS<3	SS>3	Other	No area rpt	NY total	LIS Total	LIS Total/ NY Total	ELIS / LIS Total	ELIS / NY Total
1977	272,233	82,091	25,766	56,905	131,165			568,160	380,090	66.9%	21.6%	14.4%
1978	285,934	102,210	30,772	40,805	135,468			595,189	418,916	70.4%	24.4%	17.2%
1979	316,273	117,934	71,639	78,458	184,239			768,543	505,846	65.8%	23.3%	15.3%
1980	361,794	129,445	45,740	106,146	169,247			812,372	536,979	66.1%	24.1%	15.9%
1981	345,080	179,489	57,798	85,278	198,318			865,963	582,367	67.3%	30.8%	20.7%
1982	426,716	173,309	87,209	68,410	238,454			994,098	687,234	69.1%	25.2%	17.4%
1983	648,586	314,518	128,512	100,252	241,821			1,433,689	1,091,616	76.1%	28.8%	21.9%
1984	745,870	582,336	124,568	142,366	297,979			1,893,119	1,452,774	76.7%	40.1%	30.8%
1985	835,448	661,431	170,164	99,648	176,805			1,943,496	1,667,043	85.8%	39.7%	34.0%
1986	772,426	642,841	113,615	100,344	123,526			1,752,752	1,528,882	87.2%	42.0%	36.7%
1987	717,374	646,635	114,033	164,610	115,772			1,758,424	1,478,042	84.1%	43.7%	36.8%
1988	1,199,256	707,664	280,520	133,778	152,754			2,473,972	2,187,440	88.4%	32.4%	28.6%
1989	1,239,989	792,702	289,761	160,890	149,486			2,632,828	2,322,452	88.2%	34.1%	30.1%
1990	1,865,435	1,004,551	383,697	279,872	265,287			3,798,842	3,253,683	85.6%	30.9%	26.4%
1991	2,051,002	1,205,650	313,564	215,576	261,098			4,046,890	3,570,216	88.2%	33.8%	29.8%
1992	2,495,631	1,534,069	472,514	357,699	251,893			5,111,806	4,502,214	88.1%	34.1%	30.0%
1993	2,940,032	1,404,326	407,312	359,595	382,989			5,494,254	4,751,670	86.5%	29.6%	25.6%
1994	3,136,890	2,103,652	573,462	412,944	408,410			6,635,358	5,814,004	87.6%	36.2%	31.7%
1995	3,870,353	1,496,183	741,355	310,551	451,767			6,870,209	6,107,891	88.9%	24.5%	21.8%
1996	4,103,494	2,930,100	521,272	194,618	310,131			8,059,615	7,554,866	93.7%	38.8%	36.4%
1997	4,388,887	3,272,122	552,697	259,100	405,839			8,878,645	8,213,706	92.5%	39.8%	36.9%
1998	3,987,281	2,431,136	611,389	484,963	381,121	1,549		7,897,439	7,029,806	89.0%	34.6%	30.8%
1999	2,749,791	2,315,284	889,715	163,613	328,617	7,685		6,454,705	5,954,790	92.3%	38.9%	35.9%
2000	542,533	1,358,843	585,602	101,456	292,516	2,633		2,883,583	2,486,978	86.2%	54.6%	47.1%
2001	689,159	1,136,705	431,335	70,326	243,457	2,921	15,822	2,589,725	2,257,199	87.2%	50.4%	43.9%
2002	389,988	727,581	220,594	76,112	199,644	7,545		1,621,464	1,338,163	82.5%	54.4%	44.9%
2003	436,927	383,297	575,404	53,229	248,784	-	6,051	1,703,692	1,395,628	81.9%	27.5%	22.5%

### 2.1.5 Lobster Landings by Type of Equipment

Table F-2-3 shows the total pounds of lobster caught by gear type for New York resident commercial lobster landings.

**Table F-2-3 New York Resident Commercial Lobster Landings (lbs) by gear 1998-2003**

Year	1998	1999	2000	2001	2002	2003*
Pots	7,527,616	6,322,407	2,737,876	2,533,305	1,515,840	1,408,206
Trawl	150,930	131,433	113,585	89,392	100,991	233,071
Dive	14,102	11,717	9,807	13,419	4,304	4,522
Pound	469	1,550	2,043	65	147	15,150
Other	4,862	319	1,779	150	70	379
No gear rept	199,475	13,341	13,443	16,821	113	42,419
<b>NY Total</b>	<b>7,897,454</b>	<b>6,480,767</b>	<b>2,878,533</b>	<b>2,653,152</b>	<b>1,621,465</b>	<b>1,703,747</b>
% pots	95.3%	97.6%	95.1%	95.5%	93.5%	82.7%

Source: NYS DEC

Notes: \*2003 preliminary harvest estimate, McKown 3/8/04, 66% reported.

The overwhelming majority of lobsters are caught by pots, also called traps in the nomenclature of the agency reports. In past years, pots have accounted for over 90% of all landings. Between 2002 and 2003, the landings by trawl more than doubled. In the table, the category "Trawl" means a fishing net and does not mean a trawl line with a number of traps. The trawl lines trap arrangements would be reflected in the "Pots" category.

### 2.1.6 Long Island Sound Lobster Catch Effort by Area

The NYSDEC also reported data on the number of lobster traps by each sub-area of Long Island Sound. The number of traps was divided into the total pounds of lobster landings per area to calculate the lobster catch effort, or pounds per trap. Figure 2-7 shows the average pounds per trap for each sub-area.

Figure 2-7 shows the historic trends in lobster catch effort. The catch effort for the Eastern portion of LIS has declined to about 7 lbs per trap from over 25 lbs per trap before the 1999 die-off. The long-term historic average, using the years 1977 to 2003, was about 21 lbs per trap and is reproduced below for reference purposes. The 21 lbs per trap figure is also used to bracket or frame a sensitivity analysis on key variables that can affect the estimate of direct economic impacts.



The direct economic impact estimates for the base case scenario use the 7 lbs per trap figure. The historical average is shown as an upper limit bracket for sensitivity analysis purposes.

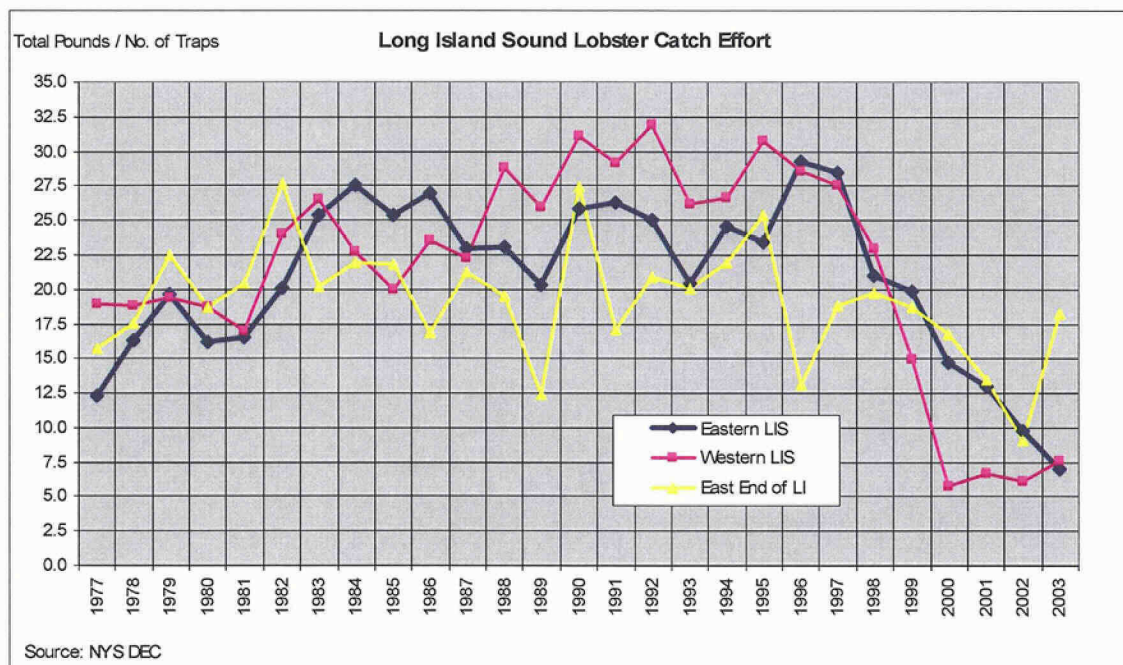


Figure 2-7 Long Island Sound Lobster Catch Effort

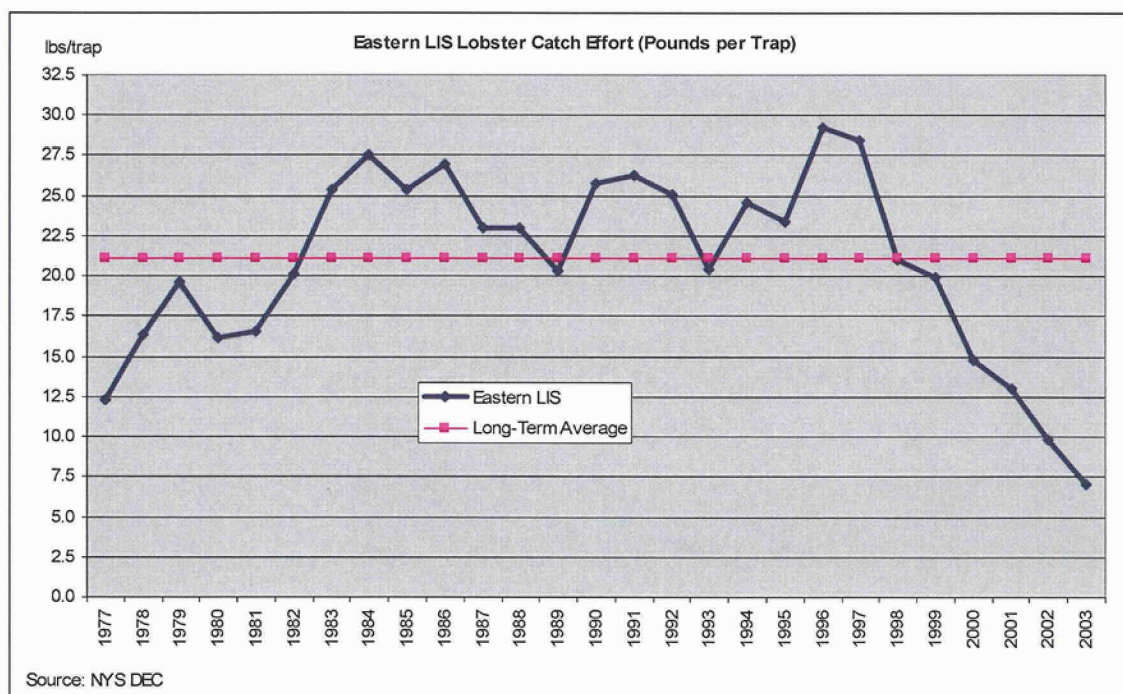


Figure 2-8 Eastern LIS Lobster Catch Effort (pound per trap)

## **2.2 Direct Economic Impacts – Estimated Value of Lobster Landings Corresponding to the Safety and Security Zone Ocean Area**

The following sections estimate the direct economic impacts, defined as the value of lobster landings that would most likely correspond to the proposed circular safety and security zone surrounding the Broadwater Project's FSRU. The proposed U.S. Coast Guard safety and security zone will be 1,210 yards as referenced to the center of the mooring tower, and the economic impacts are estimated for this zone. Given that the success of lobster fishing depends on numerous variables over the course of a year, the economic impact estimates are set up in the form of a sensitivity analysis.

### **2.2.1 Method**

The method used to estimate economic impacts is based on using the lobster pot density information contained within Resource Report No. 8, Land Use, Recreation and Aesthetics, Figure 8-8, which like all Broadwater Resource Reports, is incorporated by reference into this CZCC and its appendices. This information, obtained from the Connecticut Department of Environmental Protection (CTDEP) shows the density of lobster pot trawls observed in feet apart. The relevant Project safety and security zone area corresponds to a high density area characterized by pot trawls observed at 500 feet or less intervals. The spacing of the trawls, together with local Eastern LIS industry information on average pots per trawl, pounds per pot, and unit values (\$/lb), were used to estimate the value of lobster landings corresponding to this area. Area calculations were used to estimate how many trawls would most likely be characteristic of the densities observed from the CTDEP information.

### **2.2.2 Assumptions and Parameters**

The following data and assumptions were used to estimate the value of lobster landings that would correspond to the proposed safety and security zone area related to the FSRU during the period from 2010 to 2040. This period corresponds to both the construction phase and the operational lifetime of the Project. The assumptions and parameters used are provided in Table F-2-4 and explained in detail below for each row.

Table F-2-4 shows all of the assumptions and parameters used in the estimate of the direct economic impacts. Direct economic impacts are defined as the annual value of lobster landings that would correspond to the safety and security zone area.

- Row 1 shows the linear distance in yards from the center of the mooring tower to edge of the safety and security zone circular area.
- Row 2 shows the area calculation in square feet for the safety and security zone.
- Row 3 shows the area calculation for the total area that would most likely contain a lobster trawl. Since trawls were observed at 500 ft. intervals, it was assumed that the center of the mini circle or the nucleus would represent a trawl buoy.
- Row 4 shows the calculation that estimates the number of trawl lines contained within the circular zone. The calculation yields the number of trawls that could possibly fit within the circular safety and security zone. The calculation assumes that the spacing would be at equal intervals for order of magnitude estimation purposes.
- Row 5 shows the estimated number of traps or lobster pots per trawl. This information was provided by NYSDEC. The number of lobster traps or pots per trawl can vary between 5 and 20 in part based on the season. The direct economic impacts are measured using this entire range to bracket the possible impacts in a sensitivity analysis.
- Row 6 shows the estimated number of impacted traps (pots) that is the product of the number of trawls times the average number of pots per trawl.
- Row 7 shows the most recent calculation for the average pounds per pot from the lobster catch effort time series for the Eastern Area of LIS, (ELIS). The ELIS contains the project area footprint within its borders and so was considered a reasonable estimate average number of pounds per pot.
- Row 8 is an estimate of the total pounds or landings that would be foregone in a year because of the safety and security zone. Row 8 is equal to the product of the average pounds per trap (Row 7) times the estimated number of traps (Row 6).
- Row 9 shows a recent average price per pound (unit price) for American Lobster caught in NYS that was sourced from the NYS NOAA fisheries statistics. The time series for this unit price is shown in Figure 2-3 above. The trend line for the unit price per pound was projected forward and used to project unit prices for lobster in future project years.
- Row 10 shows the estimated annual value of lobster landings and was calculated as the product of the estimated number of total pounds (Row 8) times the unit price per pound (Row 9).

- Row 11 shows the discount rate used to discount the annual future year values of lost landings over the life of the Project (2010-2040). The future annual values are discounted to present value and summed. The 5% discount rate was used in other resource report calculations for consistency purposes and represents a rate used to discount natural resource streams and benefits. Discounting is used to take into account the time value of money.
- Row 12 shows the cumulative present value sum of all future year lobster landings over the life of the Project (2010-2040). The calculations used to measure the cumulative present value are shown in Table F-2-5 below.
- Row 13 shows the average annual equivalent value for the lobster landings. This value takes into account the cumulative present value over the life of the Project and is a measure of the average annual value taking into account price escalation and the time value of money. The value was calculated using the capital recovery factor.

**Table F-2-4 Assumptions and Parameters Used in Estimating of Direct Economic Impacts**

Row ( ) Formula	Assumption/Parameter	Safety & Security Landings Inputs
(1)	Approximate distance from center of mooring tower, yards	1,210
(2)	Estimated circular area of safety & security zone in sq. ft.	41,369,585
(3) = $\pi (2)^2$	Line spacing sq. ft. (high density, area unit = 500 ft. apart)	785,398
(4) = (2) / (3)	Estimated impacted lines	53
(5)	Lobster pots/traps per trap line \b	15
(6) = (4) x (5)	Estimated Impacted traps	790
(7)	Average pounds per trap for ELIS \c	7.0
(8) = (6) x (7)	Estimated impacted pounds	5,544
(9)	2004 unit price (\$/lb)	\$3.74
(10) = (8) x (9)	2004 Est. annual value of landings	\$20,712
(11)	Discount rate	5%
(12)	Cumulative present value sum of landings (2010-2040)	\$390,671
(13)	Average annual equivalent value of landings	\$24,126

Notes:

\a reflects feet apart, High Densities, Source: Figure Resource Report No. 8, Figure 8-8, CT DEP, 2004

\b Estimate from Kim McKown, NYSDEC (2/3/06), can be up to 5-20 traps per trap line

\c reflects recent catch effort data for 2003 from NYSDEC for Eastern LIS area

\d NOAA Fisheries

Table F-2-5 shows the detailed calculations used in estimating the direct economic impacts attributable to the proposed safety and security zone over the life of the Project. The summary values correspond to those shown in Table F-2-4 above. Table F-2-4 is based on the catch effort value of 7 pounds of lobster per pot within the ELIS as a mostly likely average value for this variable.



**Table F-2-5 Direct Economic Impacts – Lobster Landings Worksheet Using Escalated Unit Price**

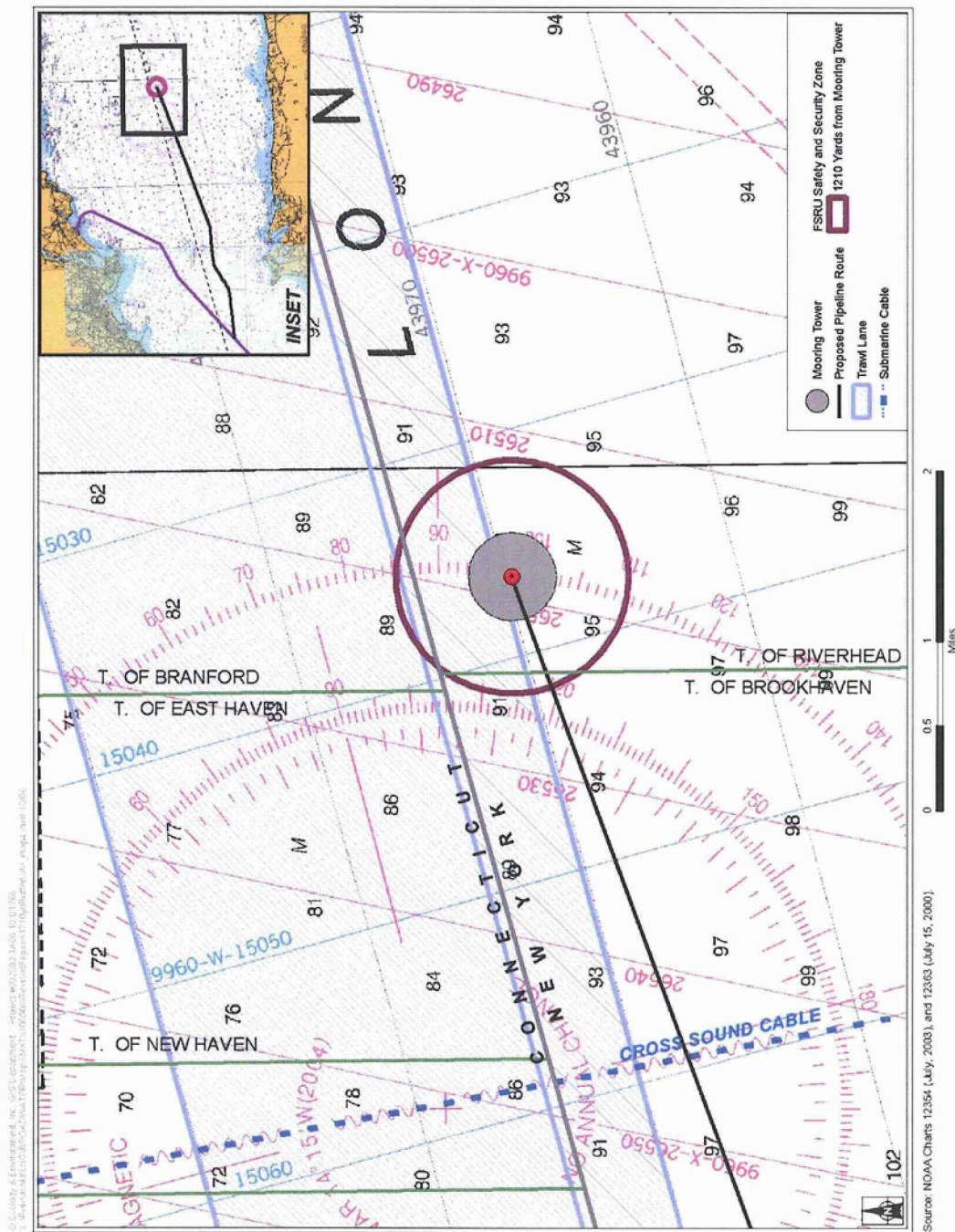
		Year	Estimated Pounds	Projected Unit Price	Estimated Value at Projected Unit Prices	Discount Factor, $i = 5\%$	Discounted Annual Values
	0	2006	0		0	1.000	0
	1	2007	0		0	0.952	0
	2	2008	0		0	0.907	0
	3	2009	0		0	0.864	0
	4	2010	5,544	\$4.42	\$24,499	0.823	\$20,156
1	5	2011	5,544	\$4.49	\$24,900	0.784	\$19,510
2	6	2012	5,544	\$4.56	\$25,301	0.746	\$18,880
3	7	2013	5,544	\$4.64	\$25,702	0.711	\$18,266
4	8	2014	5,544	\$4.71	\$26,103	0.677	\$17,667
5	9	2015	5,544	\$4.78	\$26,503	0.645	\$17,084
6	10	2016	5,544	\$4.85	\$26,904	0.614	\$16,517
7	11	2017	5,544	\$4.93	\$27,305	0.585	\$15,965
8	12	2018	5,544	\$5.00	\$27,706	0.557	\$15,428
9	13	2019	5,544	\$5.07	\$28,107	0.530	\$14,906
10	14	2020	5,544	\$5.14	\$28,507	0.505	\$14,398
11	15	2021	5,544	\$5.21	\$28,908	0.481	\$13,905
12	16	2022	5,544	\$5.29	\$29,309	0.458	\$13,427
13	17	2023	5,544	\$5.36	\$29,710	0.436	\$12,962
14	18	2024	5,544	\$5.43	\$30,111	0.416	\$12,512
15	19	2025	5,544	\$5.50	\$30,512	0.396	\$12,074
16	20	2026	5,544	\$5.58	\$30,912	0.377	\$11,651
17	21	2027	5,544	\$5.65	\$31,313	0.359	\$11,240
18	22	2028	5,544	\$5.72	\$31,714	0.342	\$10,841
19	23	2029	5,544	\$5.79	\$32,115	0.326	\$10,456
20	24	2030	5,544	\$5.87	\$32,516	0.310	\$10,082
21	25	2031	5,544	\$5.94	\$32,917	0.295	\$9,720
22	26	2032	5,544	\$6.01	\$33,317	0.281	\$9,370
23	27	2033	5,544	\$6.08	\$33,718	0.268	\$9,031
24	28	2034	5,544	\$6.15	\$34,119	0.255	\$8,704
25	29	2035	5,544	\$6.23	\$34,520	0.243	\$8,386
26	30	2036	5,544	\$6.30	\$34,921	0.231	\$8,080
27	31	2037	5,544	\$6.37	\$35,322	0.220	\$7,783
28	32	2038	5,544	\$6.44	\$35,722	0.210	\$7,497
29	33	2039	5,544	\$6.52	\$36,123	0.200	\$7,220
30	34	2040	5,544	\$6.59	\$36,529	0.190	\$6,953
Cumulative present value sum (all years):							\$390,671
Average annual equivalent landings:							\$24,126

### **2.2.3 Direct Economic Impacts**

Table F-2-5 shows the future annual landings for the proposed safety and security zone.

### **2.2.4 Sensitivity Analysis**

Several additional economic impact estimates are provided and shown in a sensitivity analysis. These direct economic impact estimates are based on changing one of the key variables displayed in Table F-2-3. Since there is uncertainty concerning the range of values that key variables can take on, estimating a range of impacts to examine how each variable can potentially influence the scale of impacts is appropriate. The sensitivity analysis can also be used to address questions concerning the effect of assumptions and the most likely range of values that can reasonably be expected.



**Figure 2-9** Area of U.S. Coast Guard Designated Safety and Security Zone

Figure 2-10 shows the results of changing the assumption used for the number of lobster pots per trawl. The base case economic impact estimate is based on using an average figure of 15 pots per trawl. Table F-2-6 shows the data used in the figure.

**Table F-2-6 Direct Economic Impacts-Summary of Sensitivity Analysis Based on Range of Lobster Pots per Trap Line**

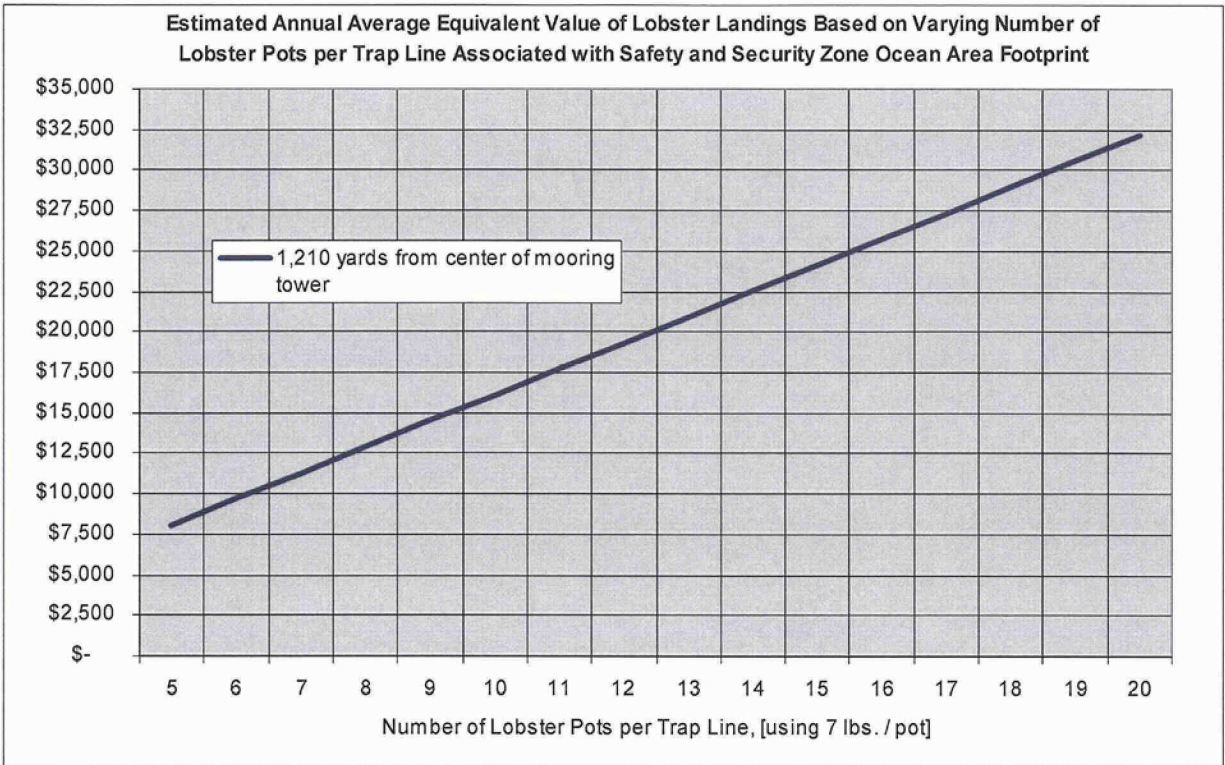
Pots Per Trawl	Direct Economic Impact
<b>Value of Average Annual Landings (2010-2040)</b>	
5	\$8,042
10	\$16,084
15	\$24,126
20	\$32,168
<b>Cumulative Present Value of Future Annual Landings (2010-2040)</b>	
5	\$130,224
10	\$260,447
15	\$390,671
20	\$520,894

A restricted access area with a 1,210 yard radius from the mooring tower would correspond to annual lobster landings valued at between \$8,000 and \$32,000 per year depending on the number of pots attached to a trawl. For the base case assumption of 15 pots per trawl, the annual value of landings would correspond to \$24,000.

### **2.2.5 Relative Size of Economic Impacts – Proposed Safety and Security Zone Ocean Area Compared to Larger Fishing Areas**

To assess the relative size of the revenues that would theoretically not be captured by area fishermen, the data in Table F-2-6 was compared to recent estimates of the total value of lobster landings for the Eastern LIS region, the entire LIS and NYS. It is possible that some lobstermen may be able to fish in adjacent waters enabling them to maintain their historic catch yields and incomes. However, local industry practices and protocols could make this form of de facto mitigation difficult to achieve. Table F-2-7 shows the results of the relative impact comparisons.





**Figure 2-10 Sensitivity Analyses: Estimated Annual Average Equivalent Value of Lobster Landings Based on Varying Number of Lobster Pots per Trawl for Ocean Areas Equivalent to the Broadwater Project Safety and Security Zone**

**Table F-2-7 Estimated Value of Lobster Landings Corresponding to Proposed Safety and Security Zone**

	1	2	3
Lobster Fishing Area	Pounds	Value	Value as Percent of Total NYS
<b>Ocean Area Alternatives Compared to Regional Lobster Landings* (2003)</b>			
Eastern LIS	383,297	\$1,792,589	22.5%
Total LIS	1,395,628	\$6,527,019	81.9%
Total NYS	1,703,692	\$7,967,761	100.0%
<b>1,210 yds</b>			
<b>Safety and Security Zone Ocean Area as a Percent of Total Lobster Landings by Area</b>			
Eastern LIS	1.3%		
Total LIS	0.4%		
Total NYS	0.3%		

Source: NYSDEC, NOAA NMFS.

Note:

\* Value of lobster landings for ELIS, LIS, and NYS were estimated from landings in pounds data provided from NYS DEC and unit prices (\$/lb) from NOAA NMFS for NYS as a whole.

The top portion of Table F-2-7 shows the pounds caught from the NYSDEC data set, while the value column represents the product of pounds caught and an average unit price (\$/lb) sourced for NYS from NMFS statewide catch data. Column (3) shows each fishing area's value as a percent of the total NYS value of lobster landings. The bottom portion of Table F-2-7 shows the value of lobster landings corresponding to the proposed safety and security zone area as a percent of the larger region's lobster landings. The average annual value of landings for the proposed 1,210 yard safety and security zone would account for 1.3% of the total value of Eastern LIS 2003 landings, and 0.3% of total NYS landings.

## 2.3 Estimated Indirect and Total Economic Impacts

This section uses the estimated average annual value of lobster landings over the life of the Project to estimate the total economic impact contribution to NYS from this industry.

### 2.3.1 The IMPLAN Economic Input-Output Model

This section uses a widely employed economic input-output model called (IMPLAN) to estimate the total economic impacts to NYS produced by the lobster landings associated with the safety and security zone area. Total economic impacts take into account the indirect and induced impacts generated from the direct economic impacts or value of lobster

landings. Revenues from lobster landings are spent by fishermen on supplies, equipment, boat repairs, fuel, insurance and other items required to sustain commercial operations.

These direct expenditures have an indirect economic impact or stimulus on the suppliers and firms that are the recipients of these subsequent rounds of spending. In addition, employees and households that earn wages from these industries are also impacted by these expenditures and they in turn spend a portion of their incomes in NYS. These latter impacts are called induced effects. The direct, indirect and induced impacts are summed and are called total economic impacts. The indirect and induced impacts represent the multiplier or ripple effects that are generated from the initial direct expenditures from the lobster landings revenues. The IMPLAN model can be used to predict the future total annual economic impacts based on an economic structure for NYS that reflects the fishing industry's linkage to other interdependent industries and institutions such as households and state and local governments (see IMPLAN Box below).

### **2.3.2 Estimated Total Economic Impacts-Average Year and Long-Term**

Economic impacts can be described by several indicators. The broadest measure of impact is called total industry output, which is equal to the value of total industry production. Economic impacts are also measured by employee earnings, value added in production and employment. Value added in production represents the sum of employee compensation, proprietor income, other property income and indirect business taxes.

#### **What is IMPLAN (Impact Analysis for Planning?)**

IMPLAN is an analytical software tool used to estimate socioeconomic impacts originally developed by researchers at the U.S. Forest Service. The model is now owned and administered by Minnesota IMPLAN Group, Inc. (MIG 2000). The IMPLAN software is an input-output based model that describes the inter-industry relationships between industries and commodity purchases within a local economy. The model relies on county and state level data sets that are continually updated by the U.S. government and by MIG, Inc. IMPLAN is used to measure the multiplier effects or total economic impacts associated with a given project's or activity's spending relationships or linkages to a region's vendors, suppliers, households, and government entities. A multiplier describes the response of the regional economy to a stimulus (e.g., annual spending associated with commercial operations) that is a change in final demand. The multiplier process represents the predictive part of the model. The model augments the traditional input-output framework with a social accounting matrix that takes into account non-industrial transactions such as the payment of taxes by businesses and households. The model can therefore also be used to conduct a fiscal impact analysis.



The economic impacts associated with the potential loss of lobster revenues for the proposed safety and security zone were estimated for an average year and also over the long-term 30 year operational life of the Project. The long-term impacts were estimated for each year over the life of the Project and also expressed as a cumulative present value sum. The cumulative present value sum is a measure of the total long-term impact in present worth terms. Table F-2-8 summarizes the estimated economic impacts. Table F-2-8 shows the annual total industry output, the broadest measure of total economic impacts for an average year and the cumulative present worth measured over the 30 year economic life of the Project. Tables F-2-9 through F-2-12 show the worksheet used to measure total economic outputs for each measure, over the Project's operational lifetime to NYS. Tables F-2-10 through F-2-12 show the long-term economic impact estimates by each year for each measure. Tables F-2-12 and F-2-13 show the associated federal and state and local tax revenues that would be associated with the economic activity corresponding to the area.

<b>Table F-2-8 Summary of Economic Impacts to NYS Associated with Ocean Area Sizes Equivalent to the FSRU Safety and Security Zone-Average Year and Long-Term Cumulative Impacts</b>		
	<b>Average Annual Impacts</b>	<b>Cumulative Impacts (2010 – 2040)</b>
<b>Total Industry Output</b>		
Direct	\$24,126	\$324,969
Indirect	\$9,333	\$125,717
Induced	\$14,706	\$198,089
Total	\$48,166	\$648,775
<b>Employee Compensation</b>		
Direct	\$5,585	\$75,231
Indirect	\$3,227	\$43,460
Induced	\$4,669	\$62,894
Total	\$13,481	\$181,585
<b>Total Value Added</b>		
Direct	\$15,013	\$202,222
Indirect	\$5,386	\$72,547
Induced	\$9,471	\$127,570
Total	\$29,870	\$402,340
<b>Employment</b>		
Direct	1.3	40
Indirect	0.1	2
Induced	0.1	4
Total	1.5	46

**Table F-2-9 Total Industry Output to NYS Associated with Ocean Area Equivalent in Size to the Proposed Safety and Security Zone**

						Discount	Discounted Annual Values				
Year		Direct	Indirect	Induced	Total	Rate = 5.0%	Direct	Indirect	Induced	Total	
0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -	
1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -	
2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -	
3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -	
1	4	2010	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.823	\$ 19,849	\$ 7,679	\$ 12,099	\$ 39,626
2	5	2011	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.784	\$ 18,903	\$ 7,313	\$ 11,523	\$ 37,739
3	6	2012	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.746	\$ 18,003	\$ 6,965	\$ 10,974	\$ 35,942
4	7	2013	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.711	\$ 17,146	\$ 6,633	\$ 10,451	\$ 34,230
5	8	2014	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.677	\$ 16,329	\$ 6,317	\$ 9,954	\$ 32,600
6	9	2015	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.645	\$ 15,552	\$ 6,016	\$ 9,480	\$ 31,048
7	10	2016	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.614	\$ 14,811	\$ 5,730	\$ 9,028	\$ 29,570
8	11	2017	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.585	\$ 14,106	\$ 5,457	\$ 8,598	\$ 28,161
9	12	2018	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.557	\$ 13,434	\$ 5,197	\$ 8,189	\$ 26,820
10	13	2019	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.530	\$ 12,795	\$ 4,950	\$ 7,799	\$ 25,543
11	14	2020	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.505	\$ 12,185	\$ 4,714	\$ 7,428	\$ 24,327
12	15	2021	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.481	\$ 11,605	\$ 4,489	\$ 7,074	\$ 23,168
13	16	2022	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.458	\$ 11,052	\$ 4,276	\$ 6,737	\$ 22,065
14	17	2023	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.436	\$ 10,526	\$ 4,072	\$ 6,416	\$ 21,015
15	18	2024	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.416	\$ 10,025	\$ 3,878	\$ 6,111	\$ 20,014
16	19	2025	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.396	\$ 9,547	\$ 3,694	\$ 5,820	\$ 19,061
17	20	2026	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.377	\$ 9,093	\$ 3,518	\$ 5,543	\$ 18,153
18	21	2027	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.359	\$ 8,660	\$ 3,350	\$ 5,279	\$ 17,289
19	22	2028	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.342	\$ 8,247	\$ 3,191	\$ 5,027	\$ 16,465
20	23	2029	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.326	\$ 7,855	\$ 3,039	\$ 4,788	\$ 15,681
21	24	2030	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.310	\$ 7,481	\$ 2,894	\$ 4,560	\$ 14,935
22	25	2031	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.295	\$ 7,124	\$ 2,756	\$ 4,343	\$ 14,223
23	26	2032	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.281	\$ 6,785	\$ 2,625	\$ 4,136	\$ 13,546
24	27	2033	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.268	\$ 6,462	\$ 2,500	\$ 3,939	\$ 12,901
25	28	2034	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.255	\$ 6,154	\$ 2,381	\$ 3,751	\$ 12,287
26	29	2035	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.243	\$ 5,861	\$ 2,267	\$ 3,573	\$ 11,702
27	30	2036	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.231	\$ 5,582	\$ 2,160	\$ 3,403	\$ 11,144
28	31	2037	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.220	\$ 5,316	\$ 2,057	\$ 3,241	\$ 10,614
29	32	2038	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.210	\$ 5,063	\$ 1,959	\$ 3,086	\$ 10,108
30	33	2039	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.200	\$ 4,822	\$ 1,865	\$ 2,939	\$ 9,627
31	34	2040	\$ 24,126	\$ 9,333	\$ 14,706	\$ 48,166	0.190	\$ 4,593	\$ 1,777	\$ 2,799	\$ 9,169
Cumulative present value sum (all years)							\$ 324,969	\$ 125,717	\$ 198,089	\$ 648,775	

**Table F- 2-10 Employee Compensation Associated with Ocean Areas Equivalent in Size to the Proposed Safety and Security Zone**

		Year					Discount Rate = 5.0%	Discounted Annual Values			
			Direct	Indirect	Induced	Total		Direct	Indirect	Induced	Total
	0	2006	\$ 0	\$ 0	\$ 0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -
	1	2007	\$ 0	\$ 0	\$ 0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -
	2	2008	\$ 0	\$ 0	\$ 0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -
	3	2009	\$ 0	\$ 0	\$ 0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -
1	4	2010	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.823	\$ 4,595	\$ 2,654	\$ 3,841	\$ 11,091
2	5	2011	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.784	\$ 4,376	\$ 2,528	\$ 3,658	\$ 10,563
3	6	2012	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.746	\$ 4,168	\$ 2,408	\$ 3,484	\$ 10,060
4	7	2013	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.711	\$ 3,969	\$ 2,293	\$ 3,318	\$ 9,581
5	8	2014	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.677	\$ 3,780	\$ 2,184	\$ 3,160	\$ 9,124
6	9	2015	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.645	\$ 3,600	\$ 2,080	\$ 3,010	\$ 8,690
7	10	2016	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.614	\$ 3,429	\$ 1,981	\$ 2,867	\$ 8,276
8	11	2017	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.585	\$ 3,266	\$ 1,886	\$ 2,730	\$ 7,882
9	12	2018	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.557	\$ 3,110	\$ 1,797	\$ 2,600	\$ 7,507
10	13	2019	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.530	\$ 2,962	\$ 1,711	\$ 2,476	\$ 7,149
11	14	2020	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.505	\$ 2,821	\$ 1,630	\$ 2,358	\$ 6,809
12	15	2021	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.481	\$ 2,687	\$ 1,552	\$ 2,246	\$ 6,485
13	16	2022	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.458	\$ 2,559	\$ 1,478	\$ 2,139	\$ 6,176
14	17	2023	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.436	\$ 2,437	\$ 1,408	\$ 2,037	\$ 5,882
15	18	2024	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.416	\$ 2,321	\$ 1,341	\$ 1,940	\$ 5,602
16	19	2025	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.396	\$ 2,210	\$ 1,277	\$ 1,848	\$ 5,335
17	20	2026	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.377	\$ 2,105	\$ 1,216	\$ 1,760	\$ 5,081
18	21	2027	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.359	\$ 2,005	\$ 1,158	\$ 1,676	\$ 4,839
19	22	2028	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.342	\$ 1,909	\$ 1,103	\$ 1,596	\$ 4,608
20	23	2029	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.326	\$ 1,818	\$ 1,050	\$ 1,520	\$ 4,389
21	24	2030	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.310	\$ 1,732	\$ 1,000	\$ 1,448	\$ 4,180
22	25	2031	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.295	\$ 1,649	\$ 953	\$ 1,379	\$ 3,981
23	26	2032	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.281	\$ 1,571	\$ 907	\$ 1,313	\$ 3,791
24	27	2033	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.268	\$ 1,496	\$ 864	\$ 1,251	\$ 3,611
25	28	2034	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.255	\$ 1,425	\$ 823	\$ 1,191	\$ 3,439
26	29	2035	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.243	\$ 1,357	\$ 784	\$ 1,134	\$ 3,275
27	30	2036	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.231	\$ 1,292	\$ 747	\$ 1,080	\$ 3,119
28	31	2037	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.220	\$ 1,231	\$ 711	\$ 1,029	\$ 2,971
29	32	2038	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.210	\$ 1,172	\$ 677	\$ 980	\$ 2,829
30	33	2039	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.200	\$ 1,116	\$ 645	\$ 933	\$ 2,694
31	34	2040	\$ 5,585	\$ 3,227	\$ 4,669	\$ 13,481	0.190	\$ 1,063	\$ 614	\$ 889	\$ 2,566
Cumulative present value sum (all years)								\$ 75,231	\$ 43,460	\$ 62,894	\$ 181,585

**Table F-2-11 Total Value Added Associated with Ocean Areas Equivalent in Size to the Proposed Safety and Security Zone**

						Discount					
Year		Direct	Indirect	Induced	Total	Rate = 5.0%	Discounted Annual Values				
							Direct	Indirect	Induced	Total	
	0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -
	1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -
	2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -
	3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -
1	4	2010	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.823	\$ 12,351	\$ 4,431	\$ 7,792	\$ 24,574
2	5	2011	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.784	\$ 11,763	\$ 4,220	\$ 7,421	\$ 23,404
3	6	2012	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.746	\$ 11,203	\$ 4,019	\$ 7,067	\$ 22,290
4	7	2013	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.711	\$ 10,670	\$ 3,828	\$ 6,731	\$ 21,228
5	8	2014	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.677	\$ 10,162	\$ 3,645	\$ 6,410	\$ 20,217
6	9	2015	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.645	\$ 9,678	\$ 3,472	\$ 6,105	\$ 19,255
7	10	2016	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.614	\$ 9,217	\$ 3,307	\$ 5,814	\$ 18,338
8	11	2017	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.585	\$ 8,778	\$ 3,149	\$ 5,537	\$ 17,464
9	12	2018	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.557	\$ 8,360	\$ 2,999	\$ 5,274	\$ 16,633
10	13	2019	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.530	\$ 7,962	\$ 2,856	\$ 5,023	\$ 15,841
11	14	2020	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.505	\$ 7,583	\$ 2,720	\$ 4,783	\$ 15,086
12	15	2021	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.481	\$ 7,222	\$ 2,591	\$ 4,556	\$ 14,368
13	16	2022	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.458	\$ 6,878	\$ 2,467	\$ 4,339	\$ 13,684
14	17	2023	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.436	\$ 6,550	\$ 2,350	\$ 4,132	\$ 13,032
15	18	2024	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.416	\$ 6,238	\$ 2,238	\$ 3,935	\$ 12,412
16	19	2025	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.396	\$ 5,941	\$ 2,131	\$ 3,748	\$ 11,821
17	20	2026	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.377	\$ 5,658	\$ 2,030	\$ 3,570	\$ 11,258
18	21	2027	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.359	\$ 5,389	\$ 1,933	\$ 3,400	\$ 10,722
19	22	2028	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.342	\$ 5,132	\$ 1,841	\$ 3,238	\$ 10,211
20	23	2029	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.326	\$ 4,888	\$ 1,754	\$ 3,083	\$ 9,725
21	24	2030	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.310	\$ 4,655	\$ 1,670	\$ 2,937	\$ 9,262
22	25	2031	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.295	\$ 4,433	\$ 1,590	\$ 2,797	\$ 8,821
23	26	2032	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.281	\$ 4,222	\$ 1,515	\$ 2,664	\$ 8,401
24	27	2033	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.268	\$ 4,021	\$ 1,443	\$ 2,537	\$ 8,001
25	28	2034	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.255	\$ 3,830	\$ 1,374	\$ 2,416	\$ 7,620
26	29	2035	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.243	\$ 3,647	\$ 1,309	\$ 2,301	\$ 7,257
27	30	2036	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.231	\$ 3,474	\$ 1,246	\$ 2,191	\$ 6,911
28	31	2037	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.220	\$ 3,308	\$ 1,187	\$ 2,087	\$ 6,582
29	32	2038	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.210	\$ 3,151	\$ 1,130	\$ 1,988	\$ 6,269
30	33	2039	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.200	\$ 3,001	\$ 1,077	\$ 1,893	\$ 5,970
31	34	2040	\$ 15,013	\$ 5,386	\$ 9,471	\$ 29,870	0.190	\$ 2,858	\$ 1,025	\$ 1,803	\$ 5,686
Cumulative present value sum (all years)							\$ 202,222	\$ 72,547	\$ 127,570	\$ 402,340	

**Table F-2-12 Tax Revenues Associated with Total Economic Activity for Ocean Areas Equivalent in Size to the Proposed Safety and Security Zone**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
Federal	\$2,544.00	\$34,264.00
State/Local	\$3,041.00	\$40,955.00
Total	\$5,584.00	\$75,218.00

**Table F-2-13 Tax Revenues by Year Associated with Ocean Area for the Proposed Safety and Security Zone**

			State/ Local			Discount Rate = 5.0%	Discounted Annual Values		
Year			Federal	Local	Total		Federal	State/Local	Total
	0	2006	0	0	\$ -	1.000	\$ -	\$ -	\$ -
	1	2007	0	0	\$ -	0.952	\$ -	\$ -	\$ -
	2	2008	0	0	\$ -	0.907	\$ -	\$ -	\$ -
	3	2009	0	0	\$ -	0.864	\$ -	\$ -	\$ -
1	4	2010	\$ 2,544	\$ 3,041	\$ 5,584	0.823	\$ 2,093	\$ 2,501	\$ 4,594
2	5	2011	\$ 2,544	\$ 3,041	\$ 5,584	0.784	\$ 1,993	\$ 2,382	\$ 4,375
3	6	2012	\$ 2,544	\$ 3,041	\$ 5,584	0.746	\$ 1,898	\$ 2,269	\$ 4,167
4	7	2013	\$ 2,544	\$ 3,041	\$ 5,584	0.711	\$ 1,808	\$ 2,161	\$ 3,969
5	8	2014	\$ 2,544	\$ 3,041	\$ 5,584	0.677	\$ 1,722	\$ 2,058	\$ 3,780
6	9	2015	\$ 2,544	\$ 3,041	\$ 5,584	0.645	\$ 1,640	\$ 1,960	\$ 3,600
7	10	2016	\$ 2,544	\$ 3,041	\$ 5,584	0.614	\$ 1,562	\$ 1,867	\$ 3,428
8	11	2017	\$ 2,544	\$ 3,041	\$ 5,584	0.585	\$ 1,487	\$ 1,778	\$ 3,265
9	12	2018	\$ 2,544	\$ 3,041	\$ 5,584	0.557	\$ 1,416	\$ 1,693	\$ 3,110
10	13	2019	\$ 2,544	\$ 3,041	\$ 5,584	0.530	\$ 1,349	\$ 1,612	\$ 2,961
11	14	2020	\$ 2,544	\$ 3,041	\$ 5,584	0.505	\$ 1,285	\$ 1,536	\$ 2,820
12	15	2021	\$ 2,544	\$ 3,041	\$ 5,584	0.481	\$ 1,224	\$ 1,463	\$ 2,686
13	16	2022	\$ 2,544	\$ 3,041	\$ 5,584	0.458	\$ 1,165	\$ 1,393	\$ 2,558
14	17	2023	\$ 2,544	\$ 3,041	\$ 5,584	0.436	\$ 1,110	\$ 1,327	\$ 2,436
15	18	2024	\$ 2,544	\$ 3,041	\$ 5,584	0.416	\$ 1,057	\$ 1,263	\$ 2,320
16	19	2025	\$ 2,544	\$ 3,041	\$ 5,584	0.396	\$ 1,007	\$ 1,203	\$ 2,210
17	20	2026	\$ 2,544	\$ 3,041	\$ 5,584	0.377	\$ 959	\$ 1,146	\$ 2,105
18	21	2027	\$ 2,544	\$ 3,041	\$ 5,584	0.359	\$ 913	\$ 1,091	\$ 2,004
19	22	2028	\$ 2,544	\$ 3,041	\$ 5,584	0.342	\$ 870	\$ 1,039	\$ 1,909
20	23	2029	\$ 2,544	\$ 3,041	\$ 5,584	0.326	\$ 828	\$ 990	\$ 1,818
21	24	2030	\$ 2,544	\$ 3,041	\$ 5,584	0.310	\$ 789	\$ 943	\$ 1,732
22	25	2031	\$ 2,544	\$ 3,041	\$ 5,584	0.295	\$ 751	\$ 898	\$ 1,649
23	26	2032	\$ 2,544	\$ 3,041	\$ 5,584	0.281	\$ 715	\$ 855	\$ 1,571
24	27	2033	\$ 2,544	\$ 3,041	\$ 5,584	0.268	\$ 681	\$ 814	\$ 1,496
25	28	2034	\$ 2,544	\$ 3,041	\$ 5,584	0.255	\$ 649	\$ 776	\$ 1,425
26	29	2035	\$ 2,544	\$ 3,041	\$ 5,584	0.243	\$ 618	\$ 739	\$ 1,357
27	30	2036	\$ 2,544	\$ 3,041	\$ 5,584	0.231	\$ 589	\$ 704	\$ 1,292
28	31	2037	\$ 2,544	\$ 3,041	\$ 5,584	0.220	\$ 561	\$ 670	\$ 1,231
29	32	2038	\$ 2,544	\$ 3,041	\$ 5,584	0.210	\$ 534	\$ 638	\$ 1,172
30	33	2039	\$ 2,544	\$ 3,041	\$ 5,584	0.200	\$ 508	\$ 608	\$ 1,116
31	34	2040	\$ 2,544	\$ 3,041	\$ 5,584	0.190	\$ 484	\$ 579	\$ 1,063
Cumulative present value sum (all years)							\$ 34,264	\$ 40,955	\$ 75,218

### **3.0 COMMERCIAL FISHERIES**

This section assembles data and information on commercial fisheries landings to estimate the economic impacts to this industry from lost access attributable to the establishment of a safety and security zone surrounding the FSRU. The impacts are estimated over the 30 year life of the Project. The commercial fisheries landings data used to estimate the long-term economic impact to this industry was reported within the summary report prepared for the Broadwater Energy Fisherman Outreach Program (Resource Report No. 8, Appendix C, p. 10), annexed as Appendix H.

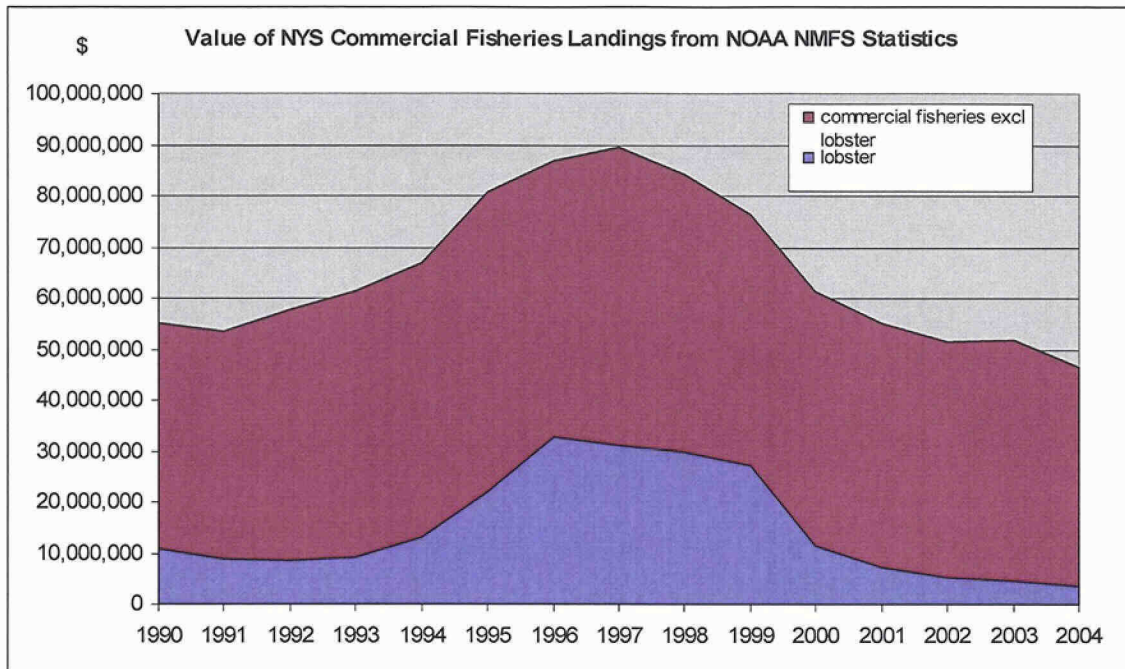
The landings and market value data obtained and analyzed were sourced from the NMFS. The data assembled reflect important trends that are considered and used in developing an impact estimate attributable to the loss of access to the safety and security zone for the proposed Project.

#### **3.1 Background Historical Market Context and Key Recent Trends**

Table F-2-1 above summarizes the economic contribution of the commercial finfish, shellfish and lobster industries to New York State. This table was reproduced from a table prepared by the Sea Grant Study. Table F-2-1 shows that in 1999, non-lobster commercial fisheries, comprised of combined finfish and shellfish, accounted for landings valued at \$50.9 million in that year, or 65% of the value of landings for all commercial fisheries. The total economic impact for this non-lobster industry segment was \$95.6 million out of a total \$149.6 million based on all commercial fishing industries, including lobster.

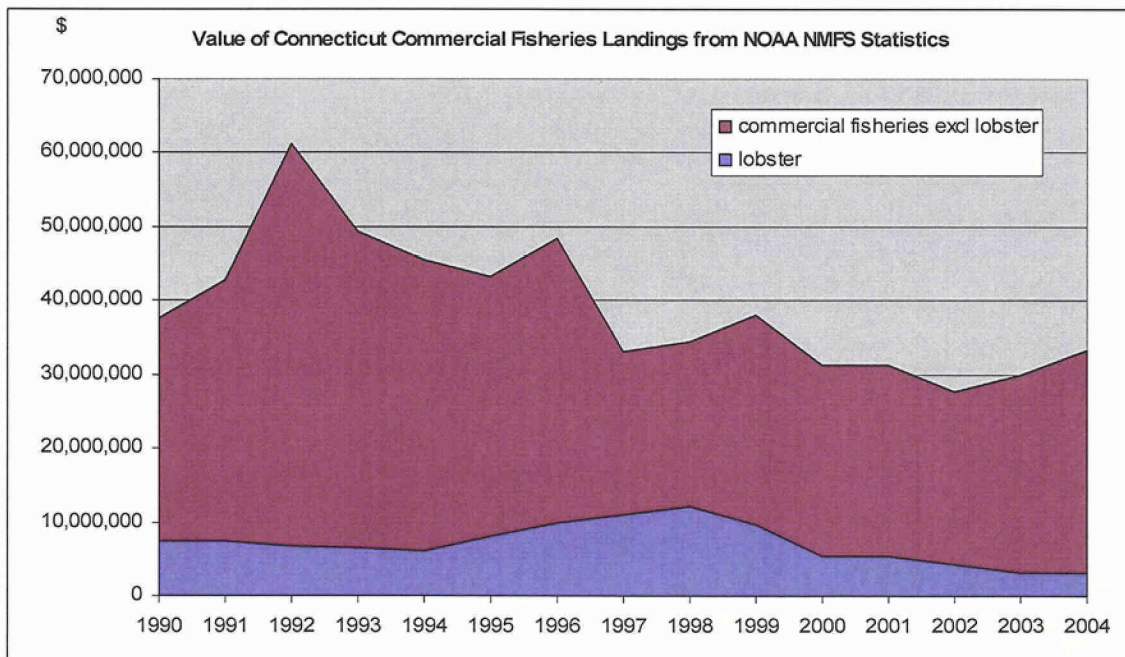
Since the Sea Grant economic impact study was completed, the total value of commercial finfish landings (including lobster) fell to \$46.4 million in 2004. Excluding lobster, the value of commercial fisheries declined from \$49.2 million in 1999 to \$42.6 million by 2004. The decline in the value of lobster landings has had the most impact on the combined value of the industry, measured by landings. Figure 3-1 shows the trends for New York State since 1990 in the value of landings organized by total commercial fisheries, and commercial fisheries excluding lobster, while Figure 3-2 shows the corresponding data for Connecticut.





Source: NOAA NMFS

**Figure 3-1 Value of NYS Commercial Fisheries Landings from NOAA NMFS Statistics**



Source: NOAA NMFS

**Figure 3-2 Value of Connecticut Commercial Fisheries Landings from NOAA NMFS Statistics**



### **3.2 Relevant Commercial Landings, Pounds and Value**

NMFS data on commercial landings in pounds was summarized in Table 1 of the Broadwater's Fishermen Outreach report, which is annexed as Appendix H. This data corresponded to a large LIS area between coordinates bounded by the East End and the West End points of demarcation. Figure 3-3 reproduces the map for this area. The NMFS data was compiled for 2002 and 2003. There is no federal requirement for vessels fishing solely within the Sound to furnish trip reports to the NMFS. The data therefore should be considered as a portion of the total potential catch within LIS corresponding to these waters and is reflective of the species most likely landed in this area.

Table F-3-1 reproduces Table 1 from the Fishermen Outreach report and adds estimated values for the pounds caught. The values were estimated using unit values (\$/lb) obtained from NMFS annual reports for the states of NY and CT. The unit value estimates were obtained by averaging the values and pounds for the species shown for NYS and CT total landings for the corresponding years. The unit value averages used to estimate the total value of landings were weighted by the pounds for each species.

#### **3.2.1 Estimation of Direct Economic Impact of Commercial Landings**

The following section describes the method, assumptions and procedures used to estimate the value of commercial fishery landings corresponding to the ocean areas that would not be accessible over the Project's 30 year lifetime. The future annual value of commercial fish landings (2010-2040) are defined as the direct economic impact. The impacts estimates are presented for an average year, and for a long-term time horizon spanning the life of the Project.

##### **3.2.1.1 Method & Assumptions**

The method used to estimate the value of commercial fisheries landings was based on using an extract of the commercial species NMFS landings data within the East End and West End large LIS area provided in the Fishermen Outreach report, which is annexed as Appendix H. The number of acres corresponding to the FSRU circular safety and security zone was compared to the ocean areas for all trawl areas corresponding to these catches. These ratios were used to scale or pro-rate the LIS NMFS landings and value data to estimate the value of landings associated with the smaller areas that would be non-accessible due to the safety and security zone.

The annual value of landings corresponding to these species within the circular area was projected forward in time over the 30 year life of the Project to arrive at an estimate of long-term impacts. No assumptions were made concerning species population growth or catch effort over this time period. The direct economic impacts or value of commercial fish landings represent order of magnitude estimates using available information.



Figure 3-3 Locations of LIS Boundaries Corresponding to NMFS Landings Data

**Table F- 3-1 Species, Total Live Pounds and Estimated Values for Fish Harvested in Long Island Sound Commercial Fisheries during the 2002 and 2003 Fishing Seasons as Provided by the National Oceanic and Atmospheric Administration**

Species	Live Pounds	Estimated Value \a
Angler	43,680	\$34,462
Scup	40,733	\$29,200
Bluefish	14,827	\$5,130
Flounder, Summer	12,513	\$24,744
Tautog	3,642	\$6,117
Butterfish	3,527	\$2,138
Squid (Loligo)	1,810	\$1,358
Skates	1,767	\$251
Sea Robbins	1,222	\$202
Sea Bass, Black	1,093	\$2,609
Flounder, Yellowtail	770	\$846
Flounder, Winter	572	\$648
Bass, Striped	272	\$681
Dogfish, Smooth	189	\$58
Hake, Red	92	\$37
Croaker, Atlantic	26	\$13
Eel, Conger	25	\$14
Bonito	12	\$18
Flounder, Sand-Dab	4	na
<b>Total:</b>	<b>126,776</b>	<b>\$108,527</b>

Source: National Oceanic and Atmospheric Administration, Broadwater Energy Fisherman Outreach, August 2005, p. 10, Table 1

Notes: \* All records are from Federal Permit numbers that possess a permit with a federal reporting requirement. \a the estimated values are based on an average annual unit value (\$/lb) that combines both New York and Connecticut catch information sourced from NMFS Annual Landings Summaries. The unit values were based on calculating the combined total value of catches (per each individual species) for each state and dividing by the combined total number of pounds. These unit values were then applied to the pounds shown in table to estimate the values for these species.

Since the NMFS landings data did not include any state landings estimates from fishermen who do not submit federal reports, the two years' worth of catch data was not prorated by year and the two year total was used as an estimate of the annual total catch for working purposes. This procedure acknowledges that the NMFS data represents a subset or portion of the total commercial fisheries activity within this relevant area.

In addition, no explicit assumptions were used concerning species population growth or catch effort.



### 3.2.2 Procedures

This section uses the above data on the commercial landings within the wide LIS area to estimate landings that are scaled to the size of the proposed safety and security zone area corresponding to the safety and security zone footprint. Data was assembled on the total acreage corresponding to the area between the East End and West End lines displayed in Figure 3-3 above. The Project safety and security zone footprint (in acres) was compared to the total trawl areas in acres. The ratios from these comparisons were used to scale the NMFS commercial landings data provided in Table F-3-1. Table F-3-2 shows the results, while Figure 3-4 shows the trawl line areas.

**Table F-3-2 Comparison of LIS Trawl Areas and Project Fishing Areas in Acres**

Trawl Areas	Acres	
A	16,734.26	
B	2,582.32	
C	2,209.21	
<b>Total</b>	<b>21,525.79</b>	
Proposed Security Zone	Acres in Trawl Area	Percent of Total Trawl Area
1,210 yds	413.42	1.9%

The data in Table F-3-2 were used to scale the total landings data for the area based on the relative number of acres. The direct economic impact estimates were based on assuming that similar types of species would be landed at depths corresponding to the proposed FSRU safety and security zone location.

Figure 3-4 below displayed the trawl areas and proposed safety and security zone area. Table F-3-3 shows the results of scaling the East End to West End Area landings using the trawl areas and the acres corresponding to the Project's footprint.

Table F-3-3 shows the results of the scaling calculations using the relative number of trawl area acres to estimate the value of fish landings. The table shows that applying this method, the proposed FSRU safety and security zone area would correspond to several thousand dollars worth of fish landings within an average year.

L:\Pensacola\INGV\ROADWATER\Maps\MXD\100506\Revised\Figures\1210yds\trawlmooring\_acres.mxd 10/2/06

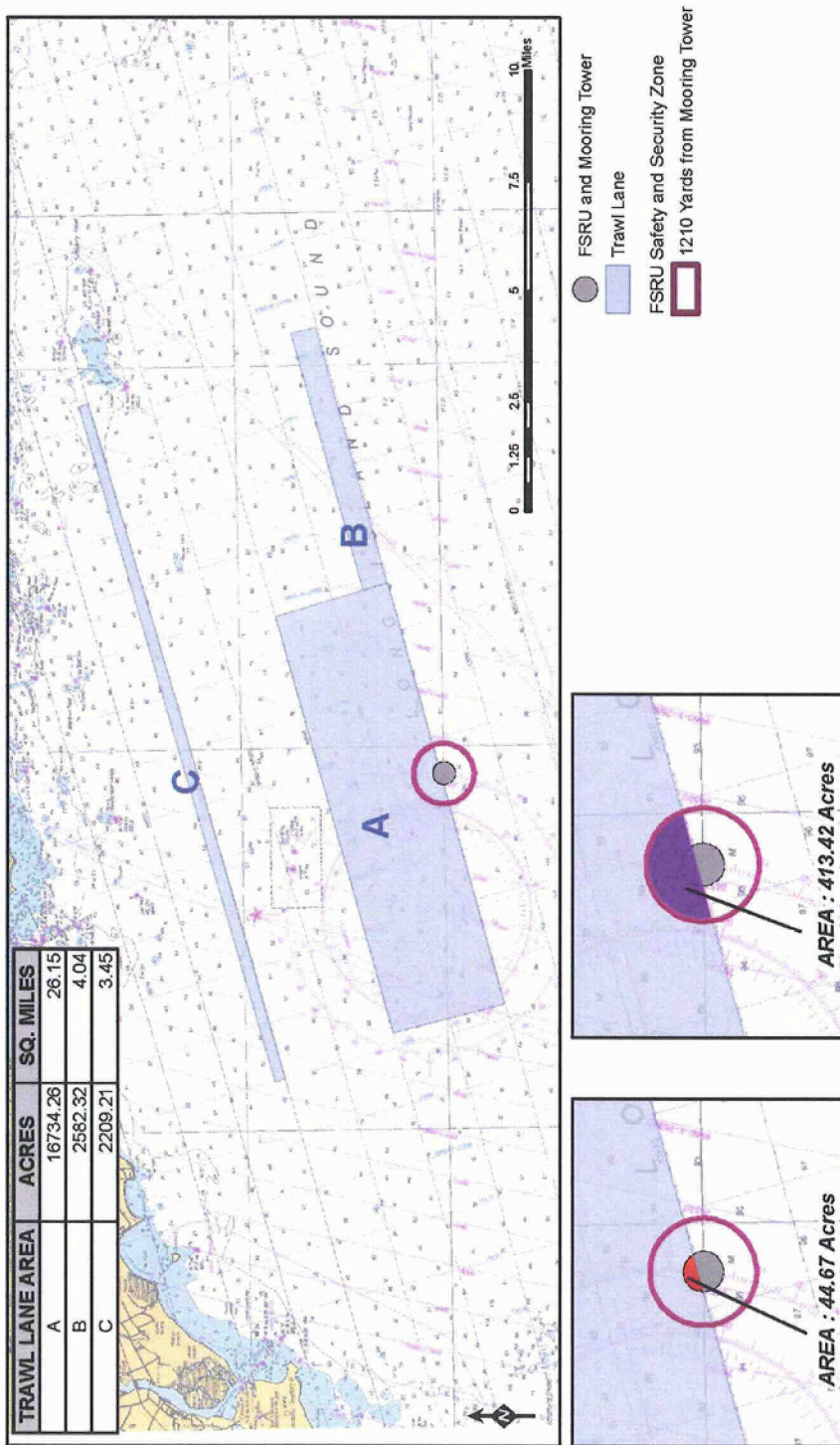


Figure 3-4 Area of Trawl Lanes Surrounding Mooring Towers

**Table F-3-3 Species, Total Live Pounds, and Estimated Value of Fish Harvested in Long Island Sound Commercial Fisheries during the 2002 and 2003 Fishing Seasons as Provided by NOAA and Estimated Values Corresponding to the Proposed Safety and Security Zone Area**

No.	Long Island Sound East to West End Ocean Area <sup>a</sup>			Landings in Pounds	Estimated Value of Landings
	Species	Pounds	Value		
1	Angler	43,680	\$34,462	838.91	\$661.87
2	Scup	40,733	\$29,200	782.31	\$560.81
3	Bluefish	14,827	\$5,130	284.76	\$98.53
4	Flounder, Summer	12,513	\$24,744	240.32	\$475.22
5	Tautog	3,642	\$6,117	69.95	\$117.48
6	Butterfish	3,527	\$2,138	67.74	\$41.07
7	Squid (Loligo)	1,810	\$1,358	34.76	\$26.08
8	Skates	1,767	\$251	33.94	\$4.82
9	Sea Robbins	1,222	\$202	23.47	\$3.89
10	Sea Bass, Black	1,093	\$2,609	20.99	\$50.11
11	Flounder, Yellowtail	770	\$846	14.79	\$16.25
12	Flounder, Winter	572	\$648	10.99	\$12.44
13	Bass, Striped	272	\$681	5.22	\$13.08
14	Dogfish, Smooth	189	\$58	3.63	\$1.12
15	Hake, Red	92	\$37	1.77	\$0.70
16	Croaker, Atlantic	26	\$13	0.50	\$0.25
17	Eel, Conger	25	\$14	0.48	\$0.27
18	Bonito	12	\$18	0.23	\$0.35
19	Flounder, Sand-Dab	4	na	0.08	na
	<b>Total:</b>	<b>126,776</b>	<b>\$108,527</b>	<b>2,434.83</b>	<b>\$2,084.34</b>

The annual value of dockside landings was used to project the total economic impacts corresponding to these areas shown below. Table F-3-4 shows the estimated direct economic impact by each year over the Project's 30 year life and the cumulative long-term economic impact. Since the impacts are expected to occur in future years, the annual and cumulative value of landings are expressed in present value terms using a 5% discount rate to acknowledge the time value of money.



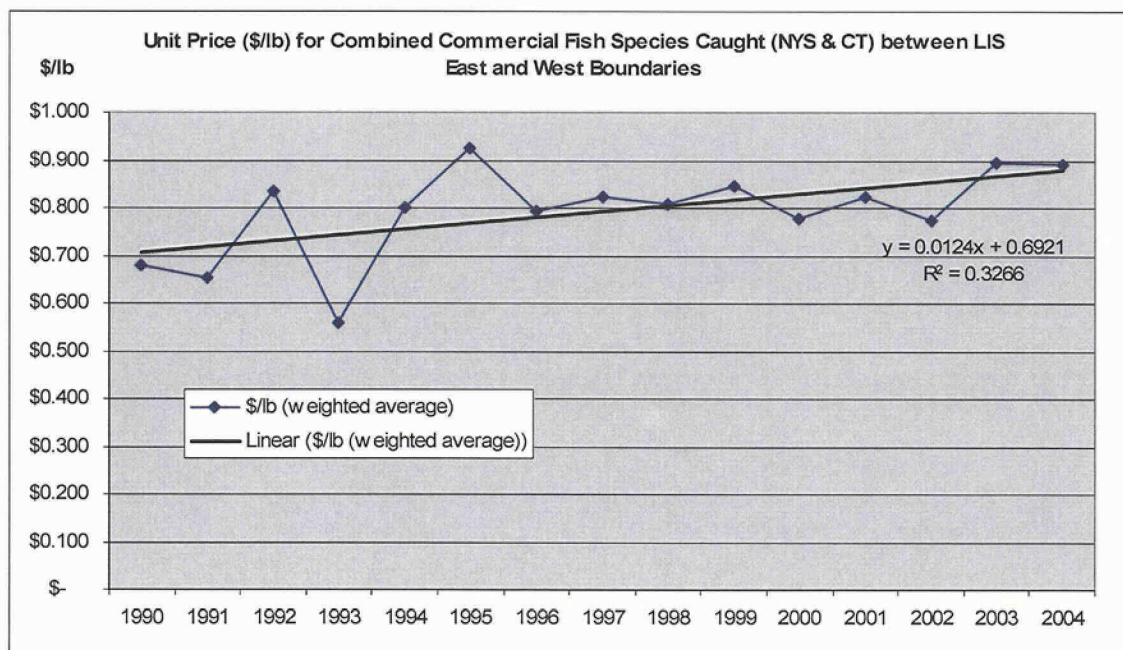
**Table F-3-4 Estimated Direct Economic Impacts by Year for Commercial Fisheries - Commercial Fisheries Landings Worksheet Using Projected Unit Prices (\$/lb) Annual Value of Landings for the Proposed Safety and Security Zone (1,210 Yds)**

		Year	Estimated Pounds Corresponding to 1,210 Yard Safety and Security Zone	Projected Price \$/lb	Estimated Value at Projected Unit Prices (1,210 Yards)	Discount Rate = 5.0%	Annual Discounted Value
	0	2006	0	\$0.903	0	1.000	0
	1	2007	0	\$0.915	0	0.952	0
	2	2008	0	\$.928	0	0.907	0
	3	2009	0	\$.940	0	0.864	0
	4	2010	2,435	\$.953	\$2,319	0.823	\$ 1,908
1	5	2011	2,435	\$.965	\$2,349	0.784	\$1,841
2	6	2012	2,435	\$.977	\$2,379	0.746	\$1,776
3	7	2013	2,435	\$.990	\$2,409	0.711	\$1,713
4	8	2014	2,435	\$.002	\$2,440	0.677	\$1,651
5	9	2015	2,435	\$.015	\$2,470	0.645	\$1,592
6	10	2016	2,435	\$.027	\$2,500	0.614	\$1,535
7	11	2017	2,435	\$.039	\$2,531	0.585	\$1,480
8	12	2018	2,435	\$.052	\$2,561	0.557	\$1,426
9	13	2019	2,435	\$.064	\$2,591	0.530	\$1,374
10	14	2020	2,435	\$.077	\$2,621	0.505	\$1,324
11	15	2021	2,435	\$.089	\$2,651	0.481	\$1,275
12	16	2022	2,435	\$.101	\$2,681	0.458	\$1,228
13	17	2023	2,435	\$.114	\$2,712	0.436	\$1,183
14	18	2024	2,435	\$.126	\$2,742	0.416	\$1,139
15	19	2025	2,435	\$.139	\$2,772	0.396	\$1,097
16	20	2026	2,435	\$.151	\$2,802	0.377	\$1,056
17	21	2027	2,435	\$.163	\$2,832	0.359	\$1,017
18	22	2028	2,435	\$.176	\$2,863	0.342	\$979
19	23	2029	2,435	\$1.188	\$2,893	0.326	\$942
20	24	2030	2,435	\$1.201	\$2,923	0.310	\$906
21	25	2031	2,435	\$1.213	\$2,953	0.295	\$872
22	26	2032	2,435	\$1.225	\$2,983	0.281	\$839
23	27	2033	2,435	\$1.238	\$3,014	0.268	\$807
24	28	2034	2,435	\$1.250	\$3,044	0.255	\$776
25	29	2035	2,435	\$1.263	\$3,074	0.243	\$747
26	30	2036	2,435	\$1.275	\$3,104	0.231	\$718
27	31	2037	2,435	\$1.287	\$3,134	0.220	\$691
28	32	2038	2,435	\$1.300	\$3,165	0.210	\$664
29	33	2039	2,435	\$1.312	\$3,195	0.200	\$639
30	34	2040	2,435	\$1.325	\$3,225	0.190	\$614
Cumulative present value sum (all years):							\$35,809

	Year	Estimated Pounds Corresponding to 1,210 Yard Safety and Security Zone	Projected Price \$/lb	Estimated Value at Projected Unit Prices (1,210 Yards)	Discount Rate = 5.0%	Annual Discounted Value
Average annual equivalent landings:						\$2,211

Table F-3-4 displays the projected annual average value of commercial fisheries landings by each year over the Project's economic life. The estimated commercial landings in pounds were held constant over the projection period but the annual unit value (\$/lb), used to calculate the annual value of landings, was increased over time based on the historic trend growth rate for all combined species. The long-term or cumulative impact over the 30 year life of the Project would vary between \$22,000 and \$53,000 in cumulative present value terms.

Figure 3-5 shows the historic time series for the combined commercial species in dollars per pound and the trend line used to project forward this weighted average unit value for all species.



Source: NOAA Fisheries

**Figure 3-5 Unit Price (\$/lb) for Combined Commercial Fish Species Caught (NYS & CT) between LIS East and West Boundaries**

### **3.3 Estimated Indirect and Total Economic Impacts**

This section uses the estimated average annual value of commercial landings over the life of the Project to estimate the total economic impact contribution to NYS from the safety and security portion of the LIS.

#### **3.3.1 The IMPLAN Economic Input-Output Model**

The IMPLAN model was used to estimate the total economic impacts to NYS produced by the commercial fishery landings associated with the proposed safety and security zone ocean area. Total economic impacts take into account the indirect and induced impacts generated from the direct economic impacts or value of fish landings. Revenues from commercial fisheries landings are spent by fishermen on supplies, equipment, boat repairs, fuel, insurance and other items required to sustain commercial operations.

#### **3.3.2 Estimated Total Economic Impacts-Average Year and Long-Term**

Economic impacts can be described by several indicators. The broadest measure of impact is called total industry output, which is equal to the total value of goods and services. Economic impacts are also measured by employee earnings, value added in production and employment. Value added in production represents the sum of employee compensation, proprietor income, other property income and indirect business taxes.

The economic impacts associated with the potential loss of commercial fisheries revenues were estimated for an average year and also over the long-term 30 year operational life of the Project. The long-term impacts were estimated for each year over the life of the Project and also expressed as a cumulative present value sum. The cumulative present value sum is a measure of the total long-term impact in present worth terms.

Table F-3-5 summarizes the estimated economic impacts for the proposed safety and security zone area. Compared to the projected impacts for the commercial lobster fisheries, the impacts anticipated to commercial fisheries would be relatively small or negligible. There would be virtually no impact on employment levels for the commercial fishing industry attributable to the loss of access to the waters taken by the security and safety zone.

Table F-3-6 shows the annual total industry output, the broadest measure of total economic impacts for an average year and the cumulative present worth measured over the 30

year economic life of the project Tables F-3-7 through F-3-9 show the actual worksheets used to calculate other measures of economic impacts over the Project's operational life time to NYS.

**Table F-3-5 Summary of Economic Impacts to NYS  
Commercial Fisheries Associated with  
Ocean Area Size Equivalent to the Proposed  
Safety and Security Zone-Average Year and  
Long-Term Cumulative Impacts**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
<b>Total Industry Output</b>		
Direct	\$2,211	\$35,809
Indirect	\$855	\$13,853
Induced	\$1,348	\$21,828
Total	\$4,415	\$71,489
<b>Employee Compensation</b>		
Direct	\$512	\$8,290
Indirect	\$296	\$4,789
Induced	\$428	\$6,930
Total	\$1,236	\$20,009
<b>Total Value Added</b>		
Direct	\$1,376	\$22,283
Indirect	\$494	\$7,994
Induced	\$868	\$14,057
Total	\$2,738	\$44,334

**Table F-3-6 Commercial Fisheries - Total Industry Output to NYS Associated with LIS  
Area Equivalent in Size to the Proposed Safety and Security Zone**

						Discount	Discounted Annual Values				
Year		Direct	Indirect	Induced	Total	Rate = 5.0%	Direct	Indirect	Induced	Total	
0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -	
1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -	
2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -	
3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -	
1	4	2010	\$ 2,319	\$ 897	\$ 1,414	\$ 4,630	0.823	\$ 1,908	\$ 738	\$ 1,163	\$ 3,809
2	5	2011	\$ 2,349	\$ 909	\$ 1,432	\$ 4,690	0.784	\$ 1,841	\$ 712	\$ 1,122	\$ 3,675
3	6	2012	\$ 2,380	\$ 921	\$ 1,450	\$ 4,751	0.746	\$ 1,776	\$ 687	\$ 1,082	\$ 3,545
4	7	2013	\$ 2,410	\$ 932	\$ 1,469	\$ 4,811	0.711	\$ 1,713	\$ 663	\$ 1,044	\$ 3,419
5	8	2014	\$ 2,440	\$ 944	\$ 1,487	\$ 4,871	0.677	\$ 1,651	\$ 639	\$ 1,007	\$ 3,297
6	9	2015	\$ 2,470	\$ 956	\$ 1,506	\$ 4,931	0.645	\$ 1,592	\$ 616	\$ 971	\$ 3,179
7	10	2016	\$ 2,500	\$ 967	\$ 1,524	\$ 4,992	0.614	\$ 1,535	\$ 594	\$ 936	\$ 3,064
8	11	2017	\$ 2,531	\$ 979	\$ 1,543	\$ 5,052	0.585	\$ 1,480	\$ 572	\$ 902	\$ 2,954
9	12	2018	\$ 2,561	\$ 991	\$ 1,561	\$ 5,112	0.557	\$ 1,426	\$ 552	\$ 869	\$ 2,847
10	13	2019	\$ 2,591	\$ 1,002	\$ 1,579	\$ 5,173	0.530	\$ 1,374	\$ 532	\$ 838	\$ 2,743
11	14	2020	\$ 2,621	\$ 1,014	\$ 1,598	\$ 5,233	0.505	\$ 1,324	\$ 512	\$ 807	\$ 2,643
12	15	2021	\$ 2,651	\$ 1,026	\$ 1,616	\$ 5,293	0.481	\$ 1,275	\$ 493	\$ 777	\$ 2,546
13	16	2022	\$ 2,681	\$ 1,037	\$ 1,635	\$ 5,353	0.458	\$ 1,228	\$ 475	\$ 749	\$ 2,452
14	17	2023	\$ 2,712	\$ 1,049	\$ 1,653	\$ 5,414	0.436	\$ 1,183	\$ 458	\$ 721	\$ 2,362
15	18	2024	\$ 2,742	\$ 1,061	\$ 1,671	\$ 5,474	0.416	\$ 1,139	\$ 441	\$ 694	\$ 2,275
16	19	2025	\$ 2,772	\$ 1,072	\$ 1,690	\$ 5,534	0.396	\$ 1,097	\$ 424	\$ 669	\$ 2,190
17	20	2026	\$ 2,802	\$ 1,084	\$ 1,708	\$ 5,594	0.377	\$ 1,056	\$ 409	\$ 644	\$ 2,108
18	21	2027	\$ 2,832	\$ 1,096	\$ 1,727	\$ 5,655	0.359	\$ 1,017	\$ 393	\$ 620	\$ 2,030
19	22	2028	\$ 2,863	\$ 1,107	\$ 1,745	\$ 5,715	0.342	\$ 979	\$ 379	\$ 597	\$ 1,954
20	23	2029	\$ 2,893	\$ 1,119	\$ 1,763	\$ 5,775	0.326	\$ 942	\$ 364	\$ 574	\$ 1,880
21	24	2030	\$ 2,923	\$ 1,131	\$ 1,782	\$ 5,836	0.310	\$ 906	\$ 351	\$ 552	\$ 1,809
22	25	2031	\$ 2,953	\$ 1,142	\$ 1,800	\$ 5,896	0.295	\$ 872	\$ 337	\$ 532	\$ 1,741
23	26	2032	\$ 2,983	\$ 1,154	\$ 1,819	\$ 5,956	0.281	\$ 839	\$ 325	\$ 511	\$ 1,675
24	27	2033	\$ 3,014	\$ 1,166	\$ 1,837	\$ 6,016	0.268	\$ 807	\$ 312	\$ 492	\$ 1,611
25	28	2034	\$ 3,044	\$ 1,178	\$ 1,855	\$ 6,077	0.255	\$ 776	\$ 300	\$ 473	\$ 1,550
26	29	2035	\$ 3,074	\$ 1,189	\$ 1,874	\$ 6,137	0.243	\$ 747	\$ 289	\$ 455	\$ 1,491
27	30	2036	\$ 3,104	\$ 1,201	\$ 1,892	\$ 6,197	0.231	\$ 718	\$ 278	\$ 438	\$ 1,434
28	31	2037	\$ 3,134	\$ 1,213	\$ 1,911	\$ 6,257	0.220	\$ 691	\$ 267	\$ 421	\$ 1,379
29	32	2038	\$ 3,165	\$ 1,224	\$ 1,929	\$ 6,318	0.210	\$ 664	\$ 257	\$ 405	\$ 1,326
30	33	2039	\$ 3,195	\$ 1,236	\$ 1,947	\$ 6,378	0.200	\$ 639	\$ 247	\$ 389	\$ 1,275
31	34	2040	\$ 3,225	\$ 1,248	\$ 1,966	\$ 6,438	0.190	\$ 614	\$ 237	\$ 374	\$ 1,226
Cumulative present value sum (all years)							\$ 35,809	\$ 13,853	\$ 21,828	\$ 71,489	
Average annual equivalent value							\$2,211	\$855	\$1,348	\$4,415	



**Table F-3-7 Commercial Fisheries – Employee Compensation Impact to NYS Associated with LIS Area Equivalent in Size to the Proposed Safety and Security Zone**

		Year					Discount Rate = 5.0%	Discounted Annual Values			
			Direct	Indirect	Induced	Total		Direct	Indirect	Induced	Total
	0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -
	1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -
	2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -
	3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -
1	4	2010	\$ 537	\$ 310	\$ 449	\$ 1,296	0.823	\$ 442	\$ 255	\$ 369	\$ 1,066
2	5	2011	\$ 544	\$ 314	\$ 455	\$ 1,313	0.784	\$ 426	\$ 246	\$ 356	\$ 1,029
3	6	2012	\$ 551	\$ 318	\$ 461	\$ 1,330	0.746	\$ 411	\$ 237	\$ 344	\$ 992
4	7	2013	\$ 558	\$ 322	\$ 466	\$ 1,347	0.711	\$ 396	\$ 229	\$ 331	\$ 957
5	8	2014	\$ 565	\$ 326	\$ 472	\$ 1,363	0.677	\$ 382	\$ 221	\$ 320	\$ 923
6	9	2015	\$ 572	\$ 330	\$ 478	\$ 1,380	0.645	\$ 369	\$ 213	\$ 308	\$ 890
7	10	2016	\$ 579	\$ 334	\$ 484	\$ 1,397	0.614	\$ 355	\$ 205	\$ 297	\$ 858
8	11	2017	\$ 586	\$ 338	\$ 490	\$ 1,414	0.585	\$ 343	\$ 198	\$ 286	\$ 827
9	12	2018	\$ 593	\$ 342	\$ 496	\$ 1,431	0.557	\$ 330	\$ 191	\$ 276	\$ 797
10	13	2019	\$ 600	\$ 346	\$ 501	\$ 1,448	0.530	\$ 318	\$ 184	\$ 266	\$ 768
11	14	2020	\$ 607	\$ 351	\$ 507	\$ 1,465	0.505	\$ 306	\$ 177	\$ 256	\$ 740
12	15	2021	\$ 614	\$ 355	\$ 513	\$ 1,481	0.481	\$ 295	\$ 171	\$ 247	\$ 713
13	16	2022	\$ 621	\$ 359	\$ 519	\$ 1,498	0.458	\$ 284	\$ 164	\$ 238	\$ 686
14	17	2023	\$ 628	\$ 363	\$ 525	\$ 1,515	0.436	\$ 274	\$ 158	\$ 229	\$ 661
15	18	2024	\$ 635	\$ 367	\$ 531	\$ 1,532	0.416	\$ 264	\$ 152	\$ 220	\$ 637
16	19	2025	\$ 642	\$ 371	\$ 536	\$ 1,549	0.396	\$ 254	\$ 147	\$ 212	\$ 613
17	20	2026	\$ 649	\$ 375	\$ 542	\$ 1,566	0.377	\$ 244	\$ 141	\$ 204	\$ 590
18	21	2027	\$ 656	\$ 379	\$ 548	\$ 1,583	0.359	\$ 235	\$ 136	\$ 197	\$ 568
19	22	2028	\$ 663	\$ 383	\$ 554	\$ 1,600	0.342	\$ 227	\$ 131	\$ 189	\$ 547
20	23	2029	\$ 670	\$ 387	\$ 560	\$ 1,616	0.326	\$ 218	\$ 126	\$ 182	\$ 526
21	24	2030	\$ 677	\$ 391	\$ 566	\$ 1,633	0.310	\$ 210	\$ 121	\$ 175	\$ 506
22	25	2031	\$ 684	\$ 395	\$ 572	\$ 1,650	0.295	\$ 202	\$ 117	\$ 169	\$ 487
23	26	2032	\$ 691	\$ 399	\$ 577	\$ 1,667	0.281	\$ 194	\$ 112	\$ 162	\$ 469
24	27	2033	\$ 698	\$ 403	\$ 583	\$ 1,684	0.268	\$ 187	\$ 108	\$ 156	\$ 451
25	28	2034	\$ 705	\$ 407	\$ 589	\$ 1,701	0.255	\$ 180	\$ 104	\$ 150	\$ 434
26	29	2035	\$ 712	\$ 411	\$ 595	\$ 1,718	0.243	\$ 173	\$ 100	\$ 145	\$ 417
27	30	2036	\$ 719	\$ 415	\$ 601	\$ 1,735	0.231	\$ 166	\$ 96	\$ 139	\$ 401
28	31	2037	\$ 726	\$ 419	\$ 607	\$ 1,751	0.220	\$ 160	\$ 92	\$ 134	\$ 386
29	32	2038	\$ 733	\$ 423	\$ 612	\$ 1,768	0.210	\$ 154	\$ 89	\$ 129	\$ 371
30	33	2039	\$ 740	\$ 427	\$ 618	\$ 1,785	0.200	\$ 148	\$ 85	\$ 124	\$ 357
31	34	2040	\$ 747	\$ 431	\$ 624	\$ 1,802	0.190	\$ 142	\$ 82	\$ 119	\$ 343
Cumulative present value sum (all years)								\$ 8,290	\$ 4,789	\$ 6,930	\$ 20,009
Average annual equivalent value								\$512	\$296	\$428	\$1,236

**Table F-3-8 Commercial Fisheries - Total Value Added Associated with LIS Area  
Equivalent in Size to the Proposed Safety and Security Zone**

						Discount Rate = 5.0%	Discounted Annual Values				
Year		Direct	Indirect	Induced	Total		Direct	Indirect	Induced	Total	
0	2006	0	0	0	\$ -	1.000	\$ -	\$ -	\$ -	\$ -	
1	2007	0	0	0	\$ -	0.952	\$ -	\$ -	\$ -	\$ -	
2	2008	0	0	0	\$ -	0.907	\$ -	\$ -	\$ -	\$ -	
3	2009	0	0	0	\$ -	0.864	\$ -	\$ -	\$ -	\$ -	
1	4	2010	\$ 1,443	\$ 518	\$ 910	\$ 2,871	0.823	\$ 1,187	\$ 426	\$ 749	\$ 2,362
2	5	2011	\$ 1,462	\$ 524	\$ 922	\$ 2,909	0.784	\$ 1,145	\$ 411	\$ 723	\$ 2,279
3	6	2012	\$ 1,481	\$ 531	\$ 934	\$ 2,946	0.746	\$ 1,105	\$ 396	\$ 697	\$ 2,198
4	7	2013	\$ 1,500	\$ 538	\$ 946	\$ 2,983	0.711	\$ 1,066	\$ 382	\$ 672	\$ 2,120
5	8	2014	\$ 1,518	\$ 545	\$ 958	\$ 3,021	0.677	\$ 1,028	\$ 369	\$ 648	\$ 2,045
6	9	2015	\$ 1,537	\$ 551	\$ 970	\$ 3,058	0.645	\$ 991	\$ 355	\$ 625	\$ 1,971
7	10	2016	\$ 1,556	\$ 558	\$ 982	\$ 3,096	0.614	\$ 955	\$ 343	\$ 603	\$ 1,900
8	11	2017	\$ 1,575	\$ 565	\$ 993	\$ 3,133	0.585	\$ 921	\$ 330	\$ 581	\$ 1,832
9	12	2018	\$ 1,593	\$ 572	\$ 1,005	\$ 3,170	0.557	\$ 887	\$ 318	\$ 560	\$ 1,765
10	13	2019	\$ 1,612	\$ 578	\$ 1,017	\$ 3,208	0.530	\$ 855	\$ 307	\$ 539	\$ 1,701
11	14	2020	\$ 1,631	\$ 585	\$ 1,029	\$ 3,245	0.505	\$ 824	\$ 296	\$ 520	\$ 1,639
12	15	2021	\$ 1,650	\$ 592	\$ 1,041	\$ 3,283	0.481	\$ 794	\$ 285	\$ 501	\$ 1,579
13	16	2022	\$ 1,669	\$ 599	\$ 1,053	\$ 3,320	0.458	\$ 764	\$ 274	\$ 482	\$ 1,521
14	17	2023	\$ 1,687	\$ 605	\$ 1,064	\$ 3,357	0.436	\$ 736	\$ 264	\$ 464	\$ 1,465
15	18	2024	\$ 1,706	\$ 612	\$ 1,076	\$ 3,395	0.416	\$ 709	\$ 254	\$ 447	\$ 1,411
16	19	2025	\$ 1,725	\$ 619	\$ 1,088	\$ 3,432	0.396	\$ 683	\$ 245	\$ 431	\$ 1,358
17	20	2026	\$ 1,744	\$ 626	\$ 1,100	\$ 3,469	0.377	\$ 657	\$ 236	\$ 415	\$ 1,308
18	21	2027	\$ 1,763	\$ 632	\$ 1,112	\$ 3,507	0.359	\$ 633	\$ 227	\$ 399	\$ 1,259
19	22	2028	\$ 1,781	\$ 639	\$ 1,124	\$ 3,544	0.342	\$ 609	\$ 218	\$ 384	\$ 1,212
20	23	2029	\$ 1,800	\$ 646	\$ 1,136	\$ 3,582	0.326	\$ 586	\$ 210	\$ 370	\$ 1,166
21	24	2030	\$ 1,819	\$ 653	\$ 1,147	\$ 3,619	0.310	\$ 564	\$ 202	\$ 356	\$ 1,122
22	25	2031	\$ 1,838	\$ 659	\$ 1,159	\$ 3,656	0.295	\$ 543	\$ 195	\$ 342	\$ 1,080
23	26	2032	\$ 1,857	\$ 666	\$ 1,171	\$ 3,694	0.281	\$ 522	\$ 187	\$ 329	\$ 1,039
24	27	2033	\$ 1,875	\$ 673	\$ 1,183	\$ 3,731	0.268	\$ 502	\$ 180	\$ 317	\$ 999
25	28	2034	\$ 1,894	\$ 680	\$ 1,195	\$ 3,768	0.255	\$ 483	\$ 173	\$ 305	\$ 961
26	29	2035	\$ 1,913	\$ 686	\$ 1,207	\$ 3,806	0.243	\$ 465	\$ 167	\$ 293	\$ 925
27	30	2036	\$ 1,932	\$ 693	\$ 1,219	\$ 3,843	0.231	\$ 447	\$ 160	\$ 282	\$ 889
28	31	2037	\$ 1,950	\$ 700	\$ 1,230	\$ 3,881	0.220	\$ 430	\$ 154	\$ 271	\$ 855
29	32	2038	\$ 1,969	\$ 706	\$ 1,242	\$ 3,918	0.210	\$ 413	\$ 148	\$ 261	\$ 822
30	33	2039	\$ 1,988	\$ 713	\$ 1,254	\$ 3,955	0.200	\$ 397	\$ 143	\$ 251	\$ 791
31	34	2040	\$ 2,007	\$ 720	\$ 1,266	\$ 3,993	0.190	\$ 382	\$ 137	\$ 241	\$ 760
Cumulative present value sum (all years)							\$ 22,283	\$ 7,994	\$ 14,057	\$ 44,334	
Average annual equivalent value							\$1,376	\$494	\$868	\$2,738	



**Table F- 3-9 Commercial Fisheries - Tax Revenues Associated with Total Economic Activity for LIS Area Equivalent in Size to the Proposed Safety and Security Zone**

	Average Annual Impacts	Cumulative Impacts (2010 – 2040)
Federal	\$233	\$3,776
State/Local	\$279	\$4,513
Total	\$512	\$8,288

The anticipated impacts to NYS commercial fisheries associated with the long-term loss of access of LIS area that would potentially be used for the proposed safety and security zone would be minor and even negligible in some instances.

### **3.4 Potential Habitat Sanctuary Impacts**

It is possible that the loss of fishing access to the safety and security zone area may also enhance select populations of commercially valuable species by functioning as a de facto haven where fishermen are precluded from entering and placing stress on these populations. The restricted access may potentially lead to a rebound in overstressed species by allowing select populations at formative lifecycle stages to recover unimpeded by the threat of fishing gear and boats. This potential impact has not been quantified or estimated but should be considered as a form of de facto mitigation over the life of the Project. Adjacent fishing grounds may possibly benefit as select populations would be enhanced by the loss of access attributable to the proposed safety and security zone.

## **4.0 LONG ISLAND SOUND RECREATION**

This section reviews the economic importance of recreational resources provided by LIS as background for determining the potential impacts to portions of the resource from the Broadwater Project's activities. These activities include both the construction period impacts and the long-term impacts expected from the establishment of a safety and security zone surrounding the FSRU during operations.

The recreational economic impacts analysis from the Broadwater Project is based on evaluating past valuation and impacts from local research conducted for LIS and showing the potential relative impacts of the Project *vis a vis* the estimated values for this larger area. This approach allows for a more informed perspective that places the economic value impacts in the proper context.

### **4.1 Background and Key Recent Trends**

The major recreational uses of the Long Island Sound include such activities as swimming, beach going, recreational/sport fishing, and recreational boating. Information and data was gathered on these recreational activities to determine annual economic impacts to the LIS community, in addition to developing a determination of potential impacts resulting from the Broadwater Project.

### **4.2 Users and Visitation**

Individuals utilizing the LIS for recreational purposes are either residents of the surrounding communities in New York and Connecticut or they are tourists from outside of the area. For residents, populations of the municipalities on LIS are all experiencing rapid growth. For example, Suffolk County, which is the most populous county bordering the LIS in the Project area, experienced an increase of 97,505 or 7.4% from 1990 to 2000. The 2000 U.S. census counted 1,419,369 residents in Suffolk County and had a 1990 census population of 1,321,864 (US Census 2006). *See* Resource Report No. 5, Socioeconomics, for additional population statistics. Assuming constant recreational participation rates, the increase in population will correspond to growing demand and participation in recreational activities on LIS by residents.

Trends in tourist visitation to LIS have been estimated based upon data received on hotel stays from the Long Island Convention and Visitors Bureau and Sports (LICVB) Commission. From 1999 to 2005, it was estimated that the number of hotel stays has remained essentially constant for Long Island (Nassau and Suffolk Counties). There was a slight drop in occupancy rates between these years; however there was also an increase in over 2,000 rooms to the hotel/motel room inventory. It was assumed that based solely on hotel stays, that tourist visitation to Long Island has remained essentially constant over the past five to six years, even though tourism as a whole over that period experienced a slowdown related to national security events.

Over the course of the next three years (2006-2008), an estimated 12 hotel properties are scheduled to open, adding approximately over 1,600 additional rooms to the current inventory (LICVB 2006). This development suggests that visitation and user days (a user day involves one person participating in an activity for a portion or all of a day) for LIS will, at a minimum, remain constant, but more likely will increase with respect to non-resident tourism/visitation.

#### **4.3 Recreational Spending**

The quantification of recreational spending in the Long Island Sound area will be divided into beach swimming, recreational/sport fishing, and recreational boating due to data availability and distinction between activities. Although Long Island Sound has been the subject of numerous studies related to such topics as water quality and biological issues, there are a limited number that have concentrated on the economic impacts from recreation and the recreational amenity valuation of the Sound.

In 1992, a study of the economic impact of these three defined recreational activities was conducted by Dr. Altobello of the University of Connecticut – *The Economic Importance of Long Island Sound's Water Quality Dependent Activities*. The results of the study are presented in Table F-4-1. The data contained in the table includes total user values, which represent the value of the resource to the actual users. Direct effects include actual spending on goods and services in the community related to recreational activities. The indirect effects represent impacts from direct recreational spending on industries throughout the region. Induced

effects represent the spending impacts from effected households along the supply chain supporting recreational spending.

**Table F-4-1 Total Recreational Values for Long Island Sound, 1990 and 2005 dollars**

	Total User Values (million \$)		Direct Effects (million \$)		Multiplier Effects (Indirect + Induced) (million \$)		Total (million \$)	
	1990	2005	1990	2005	1990	2005	1990	2005
<b>Connecticut</b>								
Beach Swimming	\$99.83	\$134.66	\$159.10	\$214.60	\$202.35	\$272.94	\$461.28	\$622.20
Sport Fishing	\$11.08	\$14.95	\$258.46	\$348.62	\$366.17	\$493.91	\$635.71	\$857.48
Boating	\$56.23	\$75.85	\$836.00	\$1,127.64	\$1,003.20	\$1,353.16	\$1,895.43	\$2,556.65
Connecticut Totals	\$167.14	\$225.45	\$1,253.56	\$1,690.86	\$1,571.72	\$2,120.01	\$2,992.42	\$4,036.32
<b>New York</b>								
Beach Swimming	\$82.57	\$111.37	\$131.59	\$177.49	\$167.36	\$225.74	\$381.52	\$514.61
Sport Fishing	\$11.13	\$15.01	\$173.09	\$233.47	\$245.22	\$330.76	\$429.44	\$579.25
Boating	\$42.33	\$57.10	\$629.31	\$848.84	\$755.17	\$1,018.61	\$1,426.81	\$1,924.55
New York Totals	\$136.03	\$183.48	\$933.99	\$1,259.81	\$1,167.75	\$1,575.12	\$2,237.77	\$3,018.41
<b>CT and NY Totals</b>	<b>\$303.17</b>	<b>\$408.93</b>	<b>\$2,187.55</b>	<b>\$2,950.67</b>	<b>\$2,739.47</b>	<b>\$3,695.13</b>	<b>\$5,230.19</b>	<b>\$7,054.73</b>

Source: Altobello 1992 and Bureau of Labor Statistics (BLS) 2006

Since this study was conducted in 1990 dollars, the results have been inflated to 2005 dollars using the Consumer Price Index (CPI). This study is the most commonly referenced study when speaking to the “economic impact of recreational activities in Long Island Sound,” and is the source of the commonly used figure of \$5.2 billion of economic impact that has been cited in the press. By using the CPI to update this 1990 impact estimate to current price levels, it was estimated that the economic impact from these recreational activities now approaches at least \$7.1 billion for the LIS. This procedure is for ballpark estimating purposes and is based on assuming similar participation levels among residents and tourists (BLS 2006). The updating of the earlier estimate does not consider demand shifts that may have occurred since the original study was completed.

The three major recreational activities are further defined and discussed in the sections below, including presentation of additional studies outlining economic impacts and the potential effect of the Broadwater Project on this resource.

#### **4.3.1 Beach Swimming**

Beach visitation and beach swimming result in a variety of economic impacts to the local community through retail purchases, food and beverage purchases, accommodations,



and miscellaneous trip expenses (i.e., gas, tolls, etc.). As presented in Table F-4-1, the total economic impact of beach swimming in Connecticut and New York was \$622.2 million and \$514.61 million respectively. This equates to a \$1,136.81 million impact total for the Long Island Sound area in 2005 dollars.

The only adjustment made to the final results of the Altobello study was an inflation adjustment to 2005 dollars based upon the CPI. An additional adjustment for the overall change in the local population and visitation numbers would be another adjustment that could be made. It is estimated that the overall population from 1990 to 2000 in the Long Island Sound study area, as designated by the 1992 report, has increased by approximately 7.5% (see Table F-4-2). The updated economic impact estimates assume that similar recreational participation rates would be in effect in 2005. It is acknowledged that these rates may have changed since 1990. However, for order of magnitude estimation purposes, the escalated economic impact estimates provide a broad perspective on the total importance of this resource to LIS. The escalated estimates show that the overall impact of beach swimming in the LIS area has increased to over \$1.1 billion annually (Altobello 1992).

**Table F-4-2 Change in Long Island Sound Population from 1990 to 2000**

	1990	2000	% change
<b>Connecticut</b>			
New London	254,957	259,088	1.62%
Middlesex	143,196	155,071	8.29%
New Haven	804,219	824,008	2.46%
Fairfield	827,645	882,567	6.64%
<b>Total</b>	<b>2,030,017</b>	<b>2,120,734</b>	<b>4.47%</b>
<b>New York</b>			
Westchester	874,866	923,459	5.55%
Nassau	1,287,348	1,334,544	3.67%
Suffolk	1,321,864	1,419,369	7.38%
Queens	1,951,958	2,229,379	14.21%
<b>Total</b>	<b>5,436,036</b>	<b>5,906,751</b>	<b>8.66%</b>
<b>LIS Total</b>	<b>7,466,053</b>	<b>8,027,485</b>	<b>7.52%</b>

Source: US Census 2006

#### 4.3.2 Recreational Boating

The 1992 study looking at the economic impact of recreational spending on various activities – including boating – estimated the economic impact of recreational boating on Long Island Sound (sum of direct, indirect and induced effects plus the user value) in 1990 as

\$3.322 billion, of which the NYS portion was \$1.427 billion. Inflated to current prices, that would translate to an overall impact of \$4.481 billion in total and \$1.925 billion for NYS (Altobello 1992).

A more recent study on recreational boating was completed in 2003 under the NY Sea Grant – *Recreational Boating Expenditures in 2003 in New York State and Their Economic Impacts*. This study breaks down impacts by geographic region; however, since it is only a state-wide study there are no economic impacts noted for Connecticut. In addition, the 2003 NY Sea Grant study indicated a much lower overall economic impact for recreational boating than the 1992 study. It estimated that the total economic impact for the New York City Long Island Metropolitan Area was \$843 million in 2003 dollars (adjusted to 2005 dollars, this would equate to \$907 million). This is only half of the \$1.925 billion impact that was estimated in the 1992 study.

According to the 2003 NY Sea Grant study, recreational boating activity has been increasing throughout NYS. There were 529,844 boats registered in 2003, which represents an increase of over 20% in the past ten years (Connelly et. al. 2004). Almost all of these registered boats were used for recreation, and only 1% indicated they used their boat as part of a charter business (Connelly et. al. 2004).

Some specific statistics presented in this study include activities while boating and the type of boats. While boating, about two-thirds of boaters also participated in fishing activities and a majority also indicated that they enjoyed cruising or sailing. Fewer boaters in downstate New York participated in water skiing or tubing compared with upstate boaters. The boat types registered in downstate New York broke down as 64.1% standard power boats, 23.0% were personal watercraft and 13% were sailboats. Individuals in downstate New York also typically owned larger boats (Connelly et. al. 2004).

The mean total trip-related expenditures per boater were \$1,380 on at-site and en route trip expenditures in 2003 (Connelly et. al. 2004). Three-quarters of this spending occurred outside of the marina or yacht club. Table F-4-3 depicts a breakdown of typical trip expenditures for New York State.

**Table F-4-3 Mean and Total Statewide Trip-Related Expenditures at the Boating Location And En-Route in 2003**

Expenditure Category	Mean Expenditure per Boater	% Total
<b>At-site expenditures</b>		
Marinas and yacht clubs	\$359	26%
Gas stations	\$214	16%
Restaurants and bars	\$184	13%
Grocery and convenience type stores	\$148	11%
Bait and tackle shops	\$62	4%
Boat launching and mooring fees	\$58	4%
Lodging	\$58	4%
Entertainment and all other expenses	\$56	4%
All other retail purchases	\$55	4%
Tournament fees	\$12	1%
<b>Total At-Site Expenditures</b>	<b>\$1,206</b>	<b>-</b>
<b>En-Route Expenditures</b>	<b>\$174</b>	<b>13%</b>
<b>Total Expenditures</b>	<b>\$1,380</b>	<b>-</b>

Source: Connelly et. al. 2004

Table F-4-4 is a breakdown of trip expenditures by geographic area in downstate New York, which may be more representative of actual spending in LIS. The mean annual expenditure per boater, per trip in LIS was \$3,112 in 2003. Adjusted for inflation, this would equate to \$3,346 in 2005 dollars.



**Table F-4-4 Trip-related (and Non-Trip Marina) Expenditures by Category and per Boater for Downstate New York Regions in 2003**

Expenditure Category	NYC Area	Long Island	Suffolk County	Long Island Sound
<b>At-site expenditures</b>				
Marinas and yacht clubs	\$16,714,906	\$41,213,188	\$33,417,610	\$19,961,521
Gas stations	\$6,047,504	\$21,520,880	\$15,064,446	\$7,733,943
Restaurants and bars	\$3,271,601	\$16,527,473	\$13,314,000	\$5,685,824
Grocery and convenience type stores	\$1,526,747	\$7,595,605	\$5,887,865	\$2,537,222
Bait and tackle shops	\$1,725,026	\$8,017,583	\$5,251,339	\$2,904,050
Boat launching and mooring fees	\$1,447,435	\$8,439,561	\$6,524,390	\$4,126,807
Lodging	\$575,099	\$1,898,901	\$1,909,578	\$1,467,309
Entertainment and all other expenses	\$2,756,076	\$2,602,198	\$2,386,972	\$1,161,620
All other retail purchases	\$396,558	\$4,430,769	\$3,766,112	\$1,772,999
Tournament fees	\$237,935	\$1,406,593	\$1,220,008	\$213,983
<b>At-site non-trip expenditures</b>				
Marinas and yacht clubs*	NA	NA	NA	\$43,928,160
<b>Total At-Site Expenditures</b>	<b>\$34,698,796</b>	<b>\$113,652,750</b>	<b>\$88,742,319</b>	<b>\$91,493,437</b>
<b>En-Route Expenditures</b>	<b>\$5,650,947</b>	<b>\$7,806,594</b>	<b>\$5,622,645</b>	<b>\$3,637,704</b>
<b>Total Expenditures</b>	<b>\$40,349,743</b>	<b>\$121,459,343</b>	<b>\$94,364,964</b>	<b>\$95,131,141</b>
Number of Boaters	19,828	70,330	53,044	30,569
Mean Expenditure per Boater	\$2,035	\$1,727	\$1,779	\$3,112

Source: Connelly et. al. 2004

\* At-site, non-trip expenditures were only tracked for specific bodies of water and would include such expenditures as annual slip or mooring rental fee, haul-out, winterization, etc.

IMPLAN software was utilized in the 2003 NY Sea Grant study to estimate the indirect and induced impacts of recreational boating. In Table F-4-5, the total output and total value added impacts are presented for the Long Island Sound in both 2003 and adjusted 2005 dollars. Total output represents the value of industrial output or total sales in the regional economy. Value added represents the sum of employee compensation, proprietor income, other property income and indirect business taxes.

**Table F-4-5 Long Island Sound - Output and Total Value Added Impacts of Regional Boating Expenditures (Trip Plus Marina-Non Trip Related) on Regions Surrounding Specific Water Bodies (2003 Dollars)**

Impact/Water Body	Direct	Indirect	Induced	Total
<b>Output</b>				
Long Island Sound (2003 dollars)	\$76,875,779	\$22,716,685	\$22,816,209	\$122,405,674
Long Island Sound (2005 dollars)	\$82,666,725	\$24,427,901	\$24,534,922	\$131,626,324
<b>Total Value Added</b>				
Long Island Sound (2003 dollars)	\$46,263,142	\$15,114,438	\$14,377,713	\$74,755,295
Long Island Sound (2005 dollars)	\$49,748,080	\$16,252,988	\$15,460,766	\$80,386,508

Source: Connelly et. al. 2004

Despite the difference in the overall total economic impact of recreational boating estimated by the two studies presented, it is apparent that this recreational activity results in significant local expenditures for boating trips, supplies, equipment, food, services, and maintenance.

### 4.3.3 Recreational/Sport Fishing

The two sources used to determine the economic impact of sport fishing in Long Island Sound were the 1992 study from the University of Connecticut and a 2001 NY Sea Grant report – *The Economic Contribution of the Sport Fishing, Commercial Fishing, and Seafood Industries to New York State*. These together form the framework for the economic impact of sport fishing.

As presented in Table F-4-1 at the beginning of this section, according to Dr. Altobello's study, the specific annual economic impact of sport fishing, inflated to 2005 dollars, in Long Island Sound on New York and Connecticut was \$579.25 and \$857.48 million respectively, for a total of \$1,436.73 million. This study examines impacts to both CT and NY; however, it fails to look at trends and specific spending characteristics of marine anglers (Altobello 1992).

Detailed tables depicting marine (saltwater) fishing characteristics and trends in New York State as part of the 2001 NY Sea Grant study are below. Table F- 4-6 shows two years of data on marine angler participation. After a peak in 1994, the total number of anglers has declined annually (Techlaw 2001).

**Table F-4-6 New York State Marine Anglers, 1996 and 1998**

Number of Anglers	Activity in New York State					
	Total		New York Residents		Non Residents	
	Number	Percent	Number	Percent	Number	Percent
1996	539,540	100%	501,130	92.9%	38,410	7.1%
1998	475,720	100%	433,226	91.1%	42,494	8.9%

Source: Techlaw 2001

An important factor in sport fishing expenditures is the mode of fishing. Many individuals fish from shore, while others own a boat or hire a fishing guide company with a boat. In Table F-4-7 below, the total number of trips and mode by fishing area are presented. It should be noted that Long Island Sound is considered an "inland water" body with respect to this study

(see note in Table F-4-7). The most popular fishing areas are inland water ways (which would include Long Island Sound) and the most popular mode of fishing is through a private or rental boat for each fishing area.

**Table F-4-7 New York State Numbers of Trips by Mode and Fishing Area, 1998**

Mode	Inland <sup>2</sup>	Percent	Ocean <= 3		Ocean > 3 miles		Total
			miles	Percent	3 miles	Percent	
Shore	1,043,064	36.0%	131,686	30.5%	N/A	0%	1,174,750
Party/Charter <sup>1</sup>	163,394	5.7%	106,071	24.6%	25,431	16.3%	294,896
Private/Rental	1,687,595	58.3%	194,141	44.9%	130,342	83.7%	2,012,078
Total	2,894,053	100%	431,898	100%	155,773	100%	3,481,724

Source: Techlaw 2001

Notes: N/A = not applicable

<sup>1</sup> Party boats conduct daily, scheduled trips and provide anglers with the ability to go fishing without advanced planning. There is a fee that covers their fishing needs. Party boat vessels carry 30 or more passengers. Charter boats carry passengers who have pre-arranged fishing trips for certain species. Fees are based on species to be fished and distance. Charter boats carry six to eight passengers, although some carry more.

<sup>2</sup> Other bodies of saltwater besides the ocean; sounds, inlets, tidal portions of rivers, bays, and estuaries.

The amount of spending by anglers in New York State by type of expenditure is presented in Table F-4-8. The highest values by type of expenditure are: (1) owned, leased property, (2) other trip expenditures, (3) special equipment, (4) fishing rods, reels, tackle, and (5) boats, motors, trailers. Although the information presented is for the entire State of New York, it defines some of the typical expenditures that anglers experience, and can be applied to marine and Long Island Sound anglers (Techlaw 2001).



**Table F-4-8 Contribution of New York Sport Fishing to State Economy by Type of Expenditure, 1996, Dollar Value (millions of 1999 dollars)**

Type of Expenditure	Value of Expenditures	Impact on Sales of Goods and Services	Total Contribution
Sport fishing expenditures	\$541.10	\$452.50	\$993.60
■ Head and charter boat fees	\$56.00	\$57.30	\$113.30
■ Marina fees	\$52.50	\$90.90	\$143.40
■ Bait	\$42.50	\$28.60	\$71.10
■ Fishing rods, reels, tackle	\$239.70	\$221.00	\$460.60
■ Boats, motors, trailers	\$150.40	\$54.70	\$205.10
Ancillary fishing expenditures	\$1,371.50	\$1,236.40	\$2,607.90
■ Other trip expenditures	\$493.00	\$525.10	\$1,018.20
■ Auxiliary equipment	\$20.40	\$18.40	\$38.80
■ Special equipment	\$302.00	\$135.10	\$437.00
■ Miscellaneous expenses	\$37.50	\$54.50	\$92.00
■ Owned, leased property	\$518.70	\$503.20	\$1,021.90
Total Sport Fishing	\$1,912.60	\$1,688.90	\$3,601.50

Source: Techlaw 2001

The areas of NYS that would be considered marine fishing include waters of the Atlantic Ocean, Long Island Sound, various estuaries and embayments of the Atlantic and the Sound, and the tidal portion of the Hudson River. The 2001 Sea Grant Study reported total contribution by anglers in NYS by marine and freshwater activities (*see* Table F-4-9). Marine fishing accounted for approximately \$1,334.5 million in 1999 dollars. Inflated to 2005 dollars, this would equate to approximately \$1,435 million (Techlaw 2001).

**Table F-4-9 Contribution of New York Sport Fishing to State Economy by Area, 1996, Dollar Value (millions of 1999 dollars)**

Location of Fishing Activity	Value of Expenditures	Impact on Sales of Goods and Services	Total Contribution
Marine	\$708.70	\$625.80	\$1,334.50
Freshwater	\$1,203.90	\$1,063.10	\$2,267.00
Total Sport Fishing	\$1,912.60	\$1,688.90	\$3,601.50

Source: Techlaw 2001

There is no available data collected that summarizes employment in the sport fishing industry. However, sport fishing employment can be estimated by using U.S. Census sales per employee data for the services and retail businesses that make up the sport fishing industry. Using this method, it is estimated that the employment impact in the sport fishing

industry is over 17,000 jobs. These jobs are a mix of full- and part-time positions (Techlaw 2001).

In addition, the spending by sport fishing anglers generates additional employment for goods and services. This employment impact is estimated at the equivalent of 19,000 full-time jobs. Estimates of sport fishing employment are presented in Table F-4-10 (Techlaw 2001).

**Table F-4-10 Contribution of New York Sport Fishing to State Economy by Area, 1996, Employment**

Location of Fishing Activity	Employment in Sport Fishing Industry (thousands of jobs)	Total Employment Impacts (thousands of FTE jobs)
Marine	6.3	7.1
Freshwater	10.8	11.9
Total Sport Fishing	17.1	19.0

Source: Techlaw 2001

#### **4.4 Potential Economic Impact from Broadwater Project**

When examined from the perspective of the total coastal zone recreational importance of Long Island Sound to the region, the potential economic impacts attributable to the Broadwater Project on the three major recreational activities described above will vary from none to negligible.

For example, swimming and beach visitation cannot be expected to be impacted as a result of the Broadwater Project due to the inherent distance from the proposed FSRU location, whereas, boating and fishing activities that could take place closer to the FSRU and the surrounding safety and security zone during Project operations could be negatively impacted. These recreational activities and estimated impacts are discussed individually below.

##### **4.4.1 Beach Swimming**

Beach visitation and swimming are activities confined, by definition, to coastal areas with beaches. The closest coastline to the proposed location of the Broadwater Project is nine miles away and does not inhibit or alter the ability of residents or tourists from participating in beach going activities or swimming. As a result, it is estimated that the Broadwater Project will have no impact on this recreational activity or its associated economic impact to the Long Island Sound area. Observations from other coastal communities around the U.S. show that

beach attendance has not been affected in any material way by compatible industrial and commercial marine activities. For instance, beach users in South Florida are accustomed to seeing large cargo and freight vessels transit the coastline within their activity view sheds. These economic activities have not detracted from the recreational experience or beach attendance as revealed in the hotel occupancy data figures.

There may be some perceived adverse impact based on the ability, from certain coastal areas and depending on weather, to see the FSRU in the Sound when either swimming or at a beach. This potential impact is discussed in Resource Report No. 8, Land Use, Recreation, and Aesthetics, and is not assumed to have a negative economic impact with respect to this recreational activity.

#### **4.4.2 Recreational Boating**

As discussed in Section 4.3.2, recreational boating on Long Island Sound is a significant economic driver and results in several billion dollars in total economic impact annually. The Boat Traffic Survey conducted for Resource Report No. 8, Land Use, Recreation and Aesthetics, which is annexed as Appendix I, outlines the approximate boating activity in the vicinity of the project site during several of the busiest boating days of the year. Beyond short-term impacts associated with construction-related activities, there are assumed to be no impacts associated with the proposed pipeline since it is on the seafloor. From the Boat Traffic Study, the following conclusions were drawn:

- Over the course of the nine boat survey days, 329 boats were recorded within 2.5 miles of the observation boat.
- Of the total, 49.5% (163/329) of the boats were recreational powerboats and 32.9% (108/329) of the boats were sailboats. Thus, 82.4% (271/329) were considered recreational boats.
- High densities of boats were recorded in proximity to Stratford Shoal (over 12 miles from the proposed FSRU location).
- 181 boats were recorded during the nine boat survey days in the vicinity of the proposed FSRU location and 44.8% of these boats observed were within 0.6 miles (1,056 yards) of the proposed FSRU location.
- This equates to approximately 2.1 boats transiting within 0.6 miles (1,056 yards) of the proposed FSRU location per survey hour.
- Once during the nine day boat survey, a regatta was observed.



The sample data provided from the Boat Traffic Survey can be used to value the recreational participation and expenditures associated with a hypothetical number of recreational boaters in the area. It was found that 2.1 boats per survey hour came within 0.6 miles of the proposed location of the FSRU. According to the 2001 NY Sea Grant study, the mean expenditure per boater was \$3,346 in 2005 dollars. Since the Boat Traffic Study was performed during the busiest boating days of the year, it will be assumed that one boat per hour is an appropriate figure, with 10 hour days and a six month (May to October) recreational boating "season." This would equate to 1,820 total boats (assuming 1 boat per hour in a 10 hour day over the course of 26 seventy hour weeks of a boating season) that would approach the proposed FSRU annually. To be conservative, using one half of the annual expenditures from other studies (6 mo./12 mo.), it is estimated that the direct expenditures extrapolated to the estimated number of boaters associated with this seasonal period would have a total direct economic impact of \$3,044,860 = ( \$3,346/2 x 1,820).

When juxtaposed against the total expenditures for Long Island Sound (shown in Table F-4-4, inflated to 2005 dollars, of \$102,297,238, the share of recreational expenditures associated with the Project vicinity would equal about 3%. However, because there are significant adjacent available boating areas, a negative impact on recreational expenditures is unlikely. In other words, it is not plausible to assume that any of these estimated area expenditures would be lost to the region's economy. The likely scenario would be that recreational boaters would choose to avoid the area of the proposed safety and security zone through prior trip planning or small course adjustments and that the area would not sustain any negative economic impact. It is highly unlikely that given the large amount of ocean area available for recreation that the Project would result in any impact on participation rates and associated spending levels.

### **Impact of Proposed Safety and Security Zone**

There are approximately 844,800 total acres in Long Island Sound (Long Island Sound Study 2006). Assuming 20% of this total area is removed because it is not suitable for recreational boating due to the proximity to shore, depth of water, or other obstructions, 675,840 acres of adequate boating water still remains. The percent total of the proposed safety and

security zone compared with the total adequate boating area of Long Island Sound are presented in Table F-4-11 below.

**Table F-4-11 Percentage of Navigable  
Water in Long Island Sound**

Proposed Security Zone	Acres in Zone	% of Total Long Island Sound
1,210 yard buffer	949.7	0.11%

The proposed safety and security zone area that would potentially be off limits to recreational boating represents a minute portion of the total usable navigable water in Long Island Sound.

Besides sailing regattas, recreational boaters typically do not follow a specific course and would be able to alter their heading to avoid the FSRU and any U.S. Coast-Guard established safety and security zone, without significantly or adversely impacting their trip. With respect to regattas where the course would potentially pass in the vicinity of the proposed safety and security zone, there is ample room for the regattas to make minor adjustments to courses, if necessary, to avoid the proposed FSRU location. The WSR also states that, in general, the majority of recreational boating occurs within 3 miles of shore. WSR § 2.2.3.1. Thus, the proposed safety and security zone should not inhibit any regattas in Long Island Sound from being held.

Some recreational boaters may choose to avoid the area surrounding the FSRU completely. It is assumed that due to the potential site of the FSRU in the middle of the Long Island Sound and the closest coast being approximately nine miles away at its closest point, recreational boaters that would prefer to avoid the FSRU have the ability to do so (i.e., the FSRU is not located directly off-shore from a port where recreational boaters would have no choice but to pass close to the FSRU and the proposed safety and security zone).

The number of recreational boaters that would choose to not boat on the Long Island Sound due to the Broadwater Project, by either moving to another body of water or not boating completely, is assumed to be virtually zero and therefore there is not anticipated to be any impact on this form of economic activity.

#### **4.4.3 Sport Fishing**

As discussed in Section 4.4.2 – Recreational Boating, the proposed FSRU and the associated safety and security zone would only occupy a small portion of the LIS. Table F-4-11 shows a breakdown in acres of the LIS waters that would no longer be accessible to anglers for sport fishing.

Sport fishing participation rates have been decreasing since 1994 according to the 2001 NY Sea Grant. With this decrease in the overall number of anglers, the conclusion could be drawn that there has been an overall decrease in competition for fishing areas in LIS. Thus, sport anglers would likely be able to find adequate fishing locations in LIS outside of the proposed safety and security zone associated with the FSRU.

The Stratford Shoal area, which is a popular fishing location and has high fisherman boat traffic as noted in the Boat Traffic Survey, is an estimated 12 miles away from the proposed FSRU location. There would be no conflict between sport fishing in the Stratford Shoal area.

## **5.0 VESSEL TRAFFIC AND LIS DEPENDENT COMMERCIAL ACTIVITY**

This section provides additional detail on the economic activity that is dependent on LIS for navigation to reach key coastal zone markets. This section also provides background details on the economic importance of waterborne commerce that would navigate around the proposed Project and an assessment of the Project's potential impact on this commercial activity.

While the following information shows that waterborne LIS trade flows can be expected to increase over the next 30 years, the increase in traffic is compatible with other LIS commercial and non-commercial activities including the Broadwater Project.

The Project is not expected to have any adverse economic impact on the future volume of waterborne commerce. The proposed Project's imported volume of energy would be consistent with current bulk movements of energy products that are conveyed to coastal zone markets on LIS by marine mode. The type of bulk freight transiting the Sound is not time sensitive and mostly supports economic activity in the non-manufacturing or service sectors of the regional economy. Even with the increased future volume of freight, siting of the Project away from the main north/south commercial shipping lanes makes any adverse economic impact on waterborne commerce unlikely.

Movements of freight running east to west and vice versa are also unlikely to be in conflict with the location of the FSRU. The results of the Boat Traffic Survey revealed only a few commercial barge vessels at distances far enough away from the Project footprint indicating that historic shipping lanes for commercial freight would not be in conflict with the proposed Broadwater FSRU location. The frequency of commercial barge traffic and distance from the FSRU demonstrates that there would be sufficient navigational leeway, even with the proposed safety and security zone, to avoid any adverse impact on vessel transit times and economic activity.

### **5.1 Background Economic Activity and Navigation Dependent Industries**

The Long Island Sound Waterborne Transportation Plan (LISWTP) was recently completed for the New York Metropolitan Transportation Council, the Greater Bridgeport Regional Planning Agency and the South Western Regional Planning Agency (LISWTP, November 2005). One of the goals of the plan was to identify how effective use of the Sound for

marine transportation of both freight and people could relieve congestion on coastal zone road networks.<sup>1</sup> The forward looking plan, out to 2025, is relevant to the coastal zone impact analysis conducted for the Broadwater Project because it evaluated movements of freight and people that are potentially susceptible to being diverted to marine service modes.

The LISWTP contains data on the baseline and projected volume of waterborne trade flows in tons for the LIS market areas proximate to the proposed Project. The market areas consisted of LIS based coastal zone communities running the entire length of Long Island Sound and the relevant portion of the Connecticut LIS shoreline. Select data and figures that are relevant to the Broadwater Project are reproduced below from the LISWTP as background and to provide context for the coastal zone economic activity.

In 2000, approximately 312 million tons of goods valued at \$798 billion dollars moved through the Long Island Sound region. This region is comprised of all major ports within the coastal zone and includes the Port Authority of New York and New Jersey.

While most of the freight movements are by truck (244 mil. annual tons/78.3%), a significant portion of the commodity freight moved in the region is by water (62 mil. tons/20%). The remaining portion of freight (5.7 mil. tons/1.8%) is moved by other modes.

Table F-5-1 shows the direction of freight movements in tons for the Long Island Sound region. More goods enter the region and are consumed within the relevant coastal markets than goods that are exported. The waterborne freight mostly supports the service-based economy of the region. Freight passing through or transiting the region accounted for 17% of the total flow of goods in 2000 (LISWTP, 2005).

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<sup>1</sup> See [http://www.nymtc.org/project/LISWTP\\_final/documents/TOC.pdf](http://www.nymtc.org/project/LISWTP_final/documents/TOC.pdf)



**Table F-5-1 Long Island Sound Region-Breakdown of Goods Movement by Type (million tons)**

Direction	2000	%
Inbound	152.8	40.9%
Outbound	111.5	29.8%
Internal	47.1	12.6%
Through	62.2	16.6%
Total:	373.6	100.0%

Source: LISWTP

The most important commodities that move by water are generally heavy low value bulk freight commodities. The top commodities by industry class include energy (petroleum or coal products), building supplies, consumer goods and food, followed by chemical and allied products. These top five commodity groups represent 72% of all tonnage moved in the region. Petroleum and coal products make effective use of the marine transportation network. Barges carrying these commodities are a common everyday site on the North Shore of LIS. Table F-5-2 shows the top five regional commodities, in annual tons, by mode for 2000.

**Table F-5-2 Long Island Sound Region - Top Five Regional Commodities by Mode, 2000 Annual tons in millions**

Commodity	Other	Marine	Truck	Total:
Petroleum or Coal Products	0.0	46.6	21.6	68.2
Clay, Concrete, Glass or Stone Products	0.2	1.2	45.2	46.6
Warehouse and Distribution Center	0.0	0.0	44.1	44.1
Food or Kindred Products	0.6	0.1	37.9	38.6
Chemicals or Allied Products	0.5	1.1	15.6	17.2
<b>Total:</b>	<b>1.3</b>	<b>49.0</b>	<b>164.4</b>	<b>214.7</b>
<b>Share of Mode in Percent (%)</b>				
Petroleum or Coal Products	0%	95%	13%	32%
Clay, Concrete, Glass or Stone Products	15%	2%	27%	22%
Warehouse and Distribution Center	0%	0%	27%	21%
Food or Kindred Products	46%	0%	23%	18%
Chemicals or Allied Products	38%	2%	9%	8%
<b>Total:</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: LISWTP

Petroleum and coal products are the most important commodity moved by barge or other vessel type within the Long Island Sound region. Petroleum and coal products accounted for 22% of the total top five commodity freight categories and 95% of the top five commodity tons moved by marine mode.



The LISWTP anticipates that the total volume of goods moving through the Long Island Sound study area will grow from 311.5 tons in 2000 to 528 million annual tons by 2025. This growth in total freight volume represents a 69.5% increase between these years. To estimate the projected order of magnitude freight volume by mode, this growth rate was applied to the 2000 total annual ton levels shown in Table F-5-2 to provide an indication of the future amount of marine commercial activity that will coincide with the operation of the Broadwater Project. Table F-5-3 shows the projected tonnage that can be expected, if the growth rate is realized.

**Table F-5-3 Top Five Regional Commodities by Mode, 2025<sup>2</sup>**

Commodity	Other	Marine	Truck	Total:
Petroleum or Coal Products	0.0	79.0	36.6	115.6
Clay, Concrete, Glass or Stone Products	0.3	2.0	76.6	79.0
Warehouse and Distribution Center	0.0	0.0	74.7	74.7
Food or Kindred Products	1.0	0.2	64.2	65.4
Chemicals or Allied Products	0.8	1.9	26.4	29.2
<b>Total:</b>	<b>2.2</b>	<b>83.1</b>	<b>278.7</b>	<b>363.9</b>
<b>Share of Mode in Percent (%)</b>				
Petroleum or Coal Products	0%	95%	13%	32%
Clay, Concrete, Glass or Stone Products	15%	2%	27%	22%
Warehouse and Distribution Center	0%	0%	27%	21%
Food or Kindred Products	46%	0%	23%	18%
Chemicals or Allied Products	38%	2%	9%	8%
<b>Total:</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Given that the purpose of the LISWTP is to identify how effective use of the Sound for marine transportation of both freight and people could relieve congestion on coastal zone road networks, it is entirely possible that additional freight will be diverted to marine modes over the projection horizon. The projected shares of total freight for the top five commodities shown in Table F-5-3 reflect the baseline 2000 level, but these can reasonably be expected to change.

It should be noted that the energy equivalent imports to be provided by the Broadwater Project would be equivalent to 7.7 million tonnes (metric) per annum from 2010-2040. These volumes are consistent with the growth in commercial activity that is contemplated by the LISWTP. The importation and transmission of this amount of energy through a subsea pipeline would be a far less intrusive way of delivering this energy to coastal zone end-users,

<sup>2</sup> Extrapolation Using Total Projected Tonnage Growth Rates and 2000 Modal Shares Annual Tons in Millions

compared to using more barges and vessels to deliver petroleum and coal products. Therefore, from a coastal zone consistency framework, the Broadwater Energy imports represent a relatively low impact, more efficient form of delivering this energy to end users, compared to introducing greater amounts of marine traffic. But for the proposed Project, including, the subsea pipeline extension, more vessels and barges would be required to satisfy future energy demand.

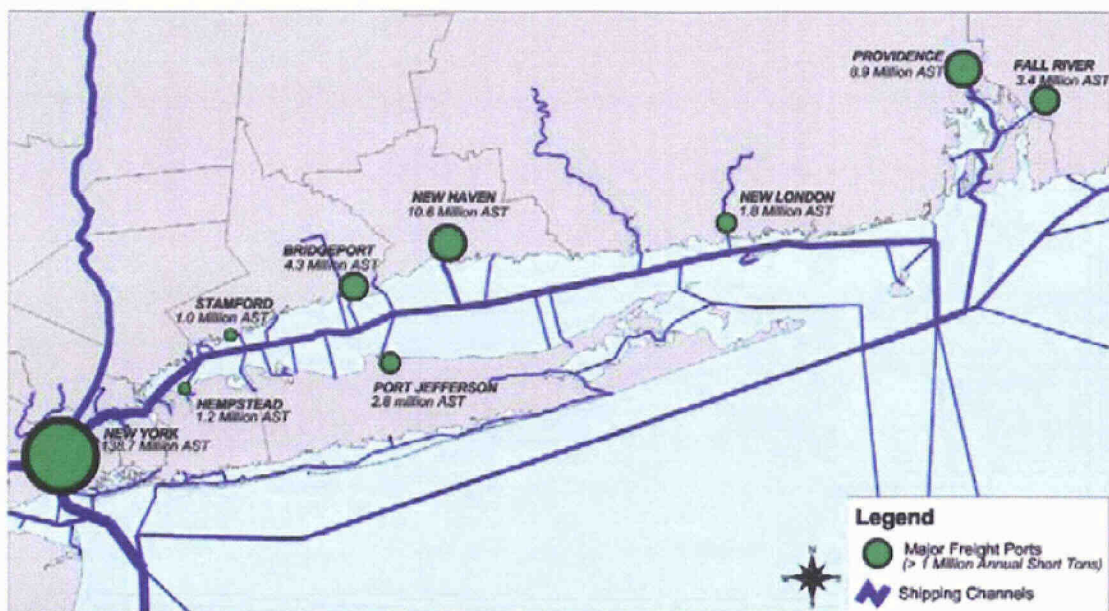
Furthermore, given the intent of the LISWTP to divert truck and other freight from congested coastal zone road networks to LIS marine modes to reach end markets, the existence of the subsea pipeline would serve to mitigate impacts associated with an equivalent amount of energy related barge traffic,

## **5.2 Vessel/Freight Transit Patterns**

Figures 5-1 and 5-2 are reproduced from the LISWTP below to illustrate the flow of freight volume transiting the LIS between the major ports that are proximate to the proposed Project location.

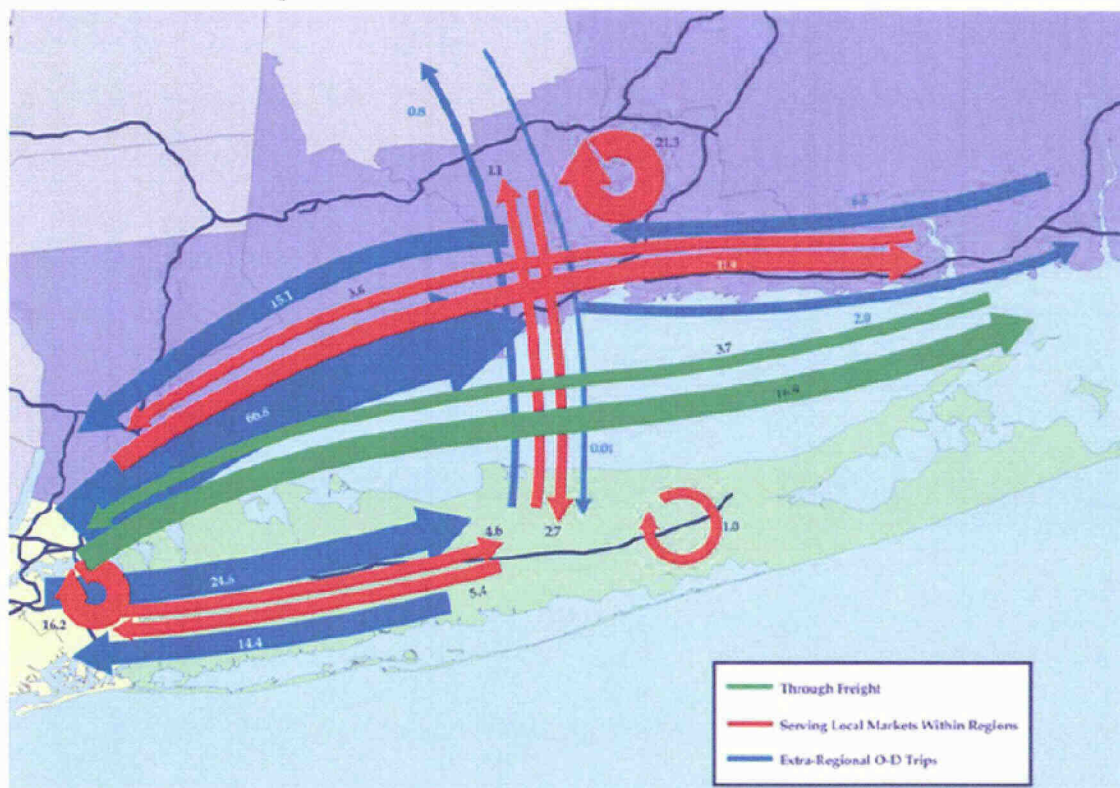
Figure 5-1 shows the major coastal zone ports and their annual total of tons of freight for 2000. The main shipping channels are also displayed. The shipping channel lines show the relative volume of freight transiting the region. In terms of annual tons of freight, the region is still dominated by the Port of New York and New Jersey followed by New Haven and Bridgeport.

Figures 5-2 and 5-3 summarize freight flows in the LIS region by market type or endpoint for both 2000 and 2025. The green lines signify trade flows that pass through the region without stopping and end up elsewhere along the eastern seaboard.



Source: LISWTP

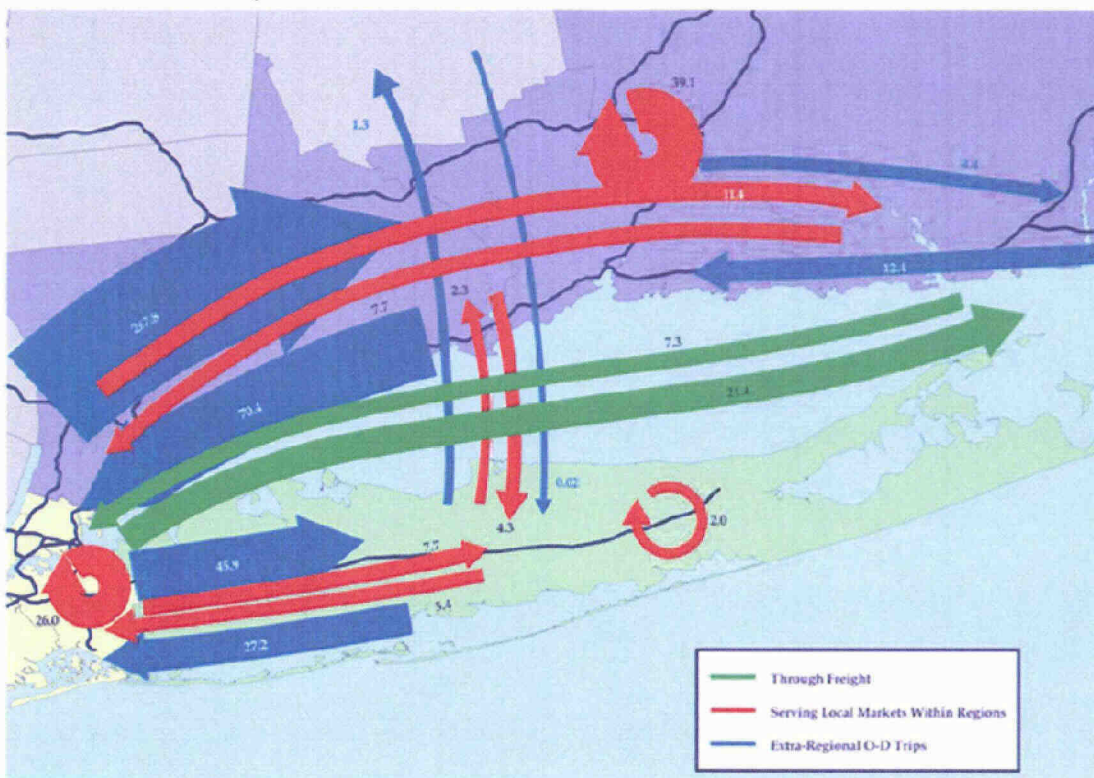
**Figure 5-1** Port Commerce Around Long Island Sound 2000



Source: LISWTP

**Figure 5-2** Summary of Annual Freight Flows, 2000 (million of annual tons)





Source: LISWTP

**Figure 5-3 Summary of Forecasted 2025 Freight Flows (million of annual tons)**

The red lines indicate flows that move freight to end markets between two LIS area ports and originate within the region. The flows marked in blue lines are flows that originate outside of the LIS region and end up at another sub-region market.

The red line flows are relevant because they reflect an evaluation of commodities that could be diverted in the future to marine modes or ferry service that would bypass more lengthy land routes. The proportional tonnage lines shown in the figures above relate to the relative proportion of baseline and projected tons of freight moved, and should not be confused with the physical width or dimensions of the shipping lanes. The figures imply that more trips/vessels would transit LIS in the future to support this freight tonnage and the expected growth in economic activity.

### 5.2.1 Potential Economic Impact from Broadwater Project

Table F-5-2 shows that annually, about 47 million tons of petroleum and coal products are moved by barge or other vessel type annually to reach LIS coastal zone markets. The Broadwater Project's annual energy importation would be equivalent to 7.7 million tonnes

(metric) per year of liquefied natural gas (LNG). This comparison shows that the Project's energy imports would be entirely compatible with both the current and planned for uses of the Sound that were contemplated within the LISWTP. The Project's proposed energy tonnage would also provide coastal zone consumers with an option to migrate from petroleum and coal to cleaner burning natural gas.

The Broadwater FSRU location and surrounding safety and security area will be incorporated into marine navigational charts, illuminated at night, and the FSRU safety and security zone will be marked by buoys. The location of the FSRU and proposed safety and security zone footprint is not large enough to result in an economic impact based on the potential interruption or delay in transiting vessels.

While some transiting vessels may need to navigate around this location, there is sufficient room within the established shipping routes to easily accommodate these changes without imposing additional operating costs to commercial vessel operators. Historically, commercial vessels and navigators have become familiar with noteworthy parts of Long Island Sound such as shoals and the Race narrows and have historically adjusted and adapted their behavior without incurring any disruptions to economic activity.

Furthermore, as the LISWTP indicated, most waterborne freight, consisting of heavy bulk commodities, is not time sensitive or tied to just-in-time inventory schedules as the freight mostly serves service sectors of the regional economy and not manufacturing. This fact suggests that the possibility of any minor delay to shipping traffic resulting from FSRU operations would not have a negative economic impact on these sectors.

It is reasonable to expect that once Broadwater terminal operations commence navigators would become familiar with the Project footprint and adjust their behavior to work with and around this site location. The East to West and West to East commercial freight traffic has adapted to North – South/South North ferry transits without any interruptions to economic activity. Similarly, the LNG vessel transits to and from the FSRU would be incorporated into existing commercial vessel flow patterns without incurring any impacts to economic activity.

The boat survey performed by Broadwater Energy indicated that large commercial vessels were primarily observed traveling east-west using established shipping

routes to the north and south of the FSRU and consequently would not be significantly impacted by the current siting location of the FSRU.

Furthermore, the scheduling of LNG carrier arrivals will take into account the use of the area by other marine traffic and will require close cooperation between Broadwater Energy, the U.S. Coast Guard, and other operators to ensure impacts on other users of the Sound are minimized. An LNG carrier traversing the Race and the Sound will be surrounded by a traveling U.S. Coast Guard-imposed safety and security zone. The recommended zone would extend 2 nautical miles ahead, 1 nautical mile astern, and 750 yards on each side of the LNG carrier. It is also important to note that based on the anticipated carrier speed of 12 knots, the approximate duration of a traveling safety and security zone at any single point would be approximately 15 minutes. As confirmed in the WSR recently issued by the U.S. Coast Guard for the Project, the effects of the moving safety and security zone around the LNG carriers on other waterway users in the Race could be managed.

#### Long Island Tourism

Information on Long Island Sound-based recreational activity was covered under Section 4.0. This section provides additional background information and economic data related to the tourism industries that support both offshore and land based recreational activities and attractions for out of town visitors.

The tourism “industry” can be comprised of firms that fall mostly within the retail trade sectors. Environmental and natural resource-based amenities on Long Island serve to attract visitors from outside the region who then spend money on goods and services within Suffolk and Nassau Counties. The tourism spending is amplified by overnight stays and attractions and visits that require overnight lengths of stays.

The region possesses a tourist infrastructure comprised of hotels/motels/bed & breakfasts and Inn and restaurants and other support services that cater to tourists. An area’s historic character or market “branding” can define the resources that attract tourists. Out of town visitors bring in new or imported dollars to a region and their spending contributes to economic growth in a region and supports other dependent industries and households. Eastern Long Island has always attracted visitors from the NYC metro area who view the less developed parts of the Island as a weekend or even day retreat or getaway destination.



Industrial and commercial activities that are considered low impact or benign serve to leave the region's particular "brand" untarnished. This is because these activities are not located in high profile areas that serve to attract out of town visitors.

### **5.3 Background Activity**

It is estimated that the 20 New York State-managed parks and historic sites (along with other locally run municipal parks) on Long Island attract nearly 20 million visitors annually. Many of these sites are located in Nassau County, close to New York City, or on the far eastern end of Long Island (New York State Office of Parks 2006). The attractions on Long Island are the coastal areas and bays for swimming, fishing, boating and other beach recreational activities, in addition to golf destinations, wine tours, inland hiking, biking and camping, and general sightseeing tours.

Specific popular attractions in Suffolk County, NY, include the Vanderbilt Museum, Walt Whitman Historic Site and the Stony Brook Grist Mill in the "North Shore" area. Central Suffolk County attractions include a top-rated water park, Splish Splash, and the Atlantis Marine World aquarium in Riverhead, NY. In eastern Long Island the two "forks" each offer unique attractions. North Fork is more rural, with vineyards, farm stands and smaller villages. South Fork is the location of the more exclusive Hamptons, which includes upscale dining and shopping (LICVB 2006).

The Long Island wine industry is a growing tourist destination that has received significant attention and funds over the past decade. There are 38 licensed wine producers on Long Island, 33 of which are located on the North Fork (30 on LI and 26 on North Fork are open to the public). It is estimated that there are approximately 500,000 visitors to the East End wineries annually (Long Island Wine Country 2006).

Access to Long Island can also be gained through use of buses, trains, ferries or personal vehicles or plane. Airports generally serving tourists coming to Long Island include the following:

JFK International Airport	LaGuardia Airport
Brookhaven Airport	Republic Airport Farmingdale
Lufker Airport East Moriches	East Hampton Airport
Islip Airport	Mattituck Airport
Francis S. Gabreski Airport Westhampton	Montauk Airport
Long Island MacArthur Airport	
Source: Long Island Browser 2006	

Tourism-related employment figures for NYS and Long Island (Nassau and Suffolk Counties) are presented in Table F-6-1. As indicated in the table notes, the tourism-related employment data is estimated from a "Travel & Tourism Cluster" of industries, which are then prorated based on assumptions of purchases and spending directly related to tourists (not residents). Thus, the figure of 38,130 pro-rated 2004 Long Island employment is representative of jobs that cater directly to non-resident, out-of-town tourists visiting local attractions.

**Table F-6-1 Tourism Related Employment and Wages for New York State and Long Island (2004)**

	Pro-Rated Employment	Pro-Rated Total Wages	Average Wages
New York State	333,530	\$10,818,540	\$32,400
Long Island	38,130	\$1,105,120	\$29,000
Nassau	19,380	\$581,191	\$30,000
Suffolk	18,750	\$523,930	\$27,900

Source: N.Y. State Dept. of Labor 2006

Notes:

1. ESD counts 70 6-digit NAICS-based industries as part of the Travel & Tourism Cluster; this industry list is further broken down into 5 sub-clusters including: 1) Travel Retail; 2) Passenger Transportation; 3) Culture, Recreation and Amusements; 4) Accommodations; and 5) Food Services.
2. As it has for the past few years, ESD pro-rates industry employment and wages data by only counting that share of employment and wages in an industry attributable to purchases made by tourists. Share estimates were developed by the BEA (For example, according to the BEA, approximately 20 percent of all food and beverage purchases are made by visitors, while the remaining 80 percent are made by local residents.)
3. Pro-rated County and regional travel & tourism employment and wages data for 2004 are attached. Also included is a list of tourism industries and their respective pro-ration shares.

Although tourism is a major industry in Long Island, generating an estimated \$65 million in annual sales, it is not a major source of employment in Nassau and Suffolk Counties.

#### **5.4 Potential Economic Impact from the Broadwater Project**

Negative impact to historic tourism levels and associated spending from the proposed Project is not expected. The Project will not affect the Long Island area's natural

resources and amenities that serve to attract tourists. The Project will be sited at a significant distance from any coastal areas that would attract tourism. In addition, land-based activities to support Broadwater will be small and low impact in scope. Therefore, the Broadwater Project is not expected to have any adverse effect on the regional “branding” that defines the tourist experience on Long Island, and the level of spending that is derived from tourism is not anticipated to be negatively affected by the Project.

It would take a significant, protracted change in commercial and industrial activity and development to affect the particular “brand” that defines Eastern Long Island. Open spaces and access to water are amenities that “brand” this part of Long Island.

The marketing appeal and branding for a sub-area such as a wine country area will not be impacted by offshore commerce. In addition, ecologically fragile areas that function as regional eco-tourist attractions such as the North Fork and the Pine Barrens (*see* Figure 6-1 for geographic reference) would not be impacted by the Project. As long as the resources that attract tourism remain intact, the tourist based economic sectors that depend on this visitation will not be impacted.



Source: The Nature Conservancy, <http://nature.org/wherewework/northamerica/states/newyork/preserves/art10990.html>

**Figure 6-1 Pine Barrens Area of Long Island**

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**REVISED APPENDIX J**

**LNG CARRIER ROUTE ANALYSIS  
APPENDIX A TO RESOURCE REPORT NO. 8**

**October 2006**

**APPENDIX A**  
**LNG CARRIER ROUTE ANALYSIS**

In addition to analyzing the onshore coastal regions in the immediate vicinity of the Project, Broadwater also conducted an analysis of major sensitive receptors on the shorelines along the LNG carrier routes entering into Block Island Sound and Long Island Sound from the Atlantic Ocean. The analysis covers shorelines and relevant offshore features from Point Judith, Rhode Island, and Montauk, New York, to the entrance into Long Island Sound at the Race and onwards to the proposed FSRU location. This includes an analysis of the shoreline features of Rhode Island, the far eastern shorelines of New York and Connecticut, and Block Island. To facilitate the discussion of the routing, waypoints have been identified along the route where course changes would likely occur.

Broadwater's initial analysis in the April 2006 CZCC was based on estimated LNG carrier routes from U.S. territorial border south (Southern Route) or southeast (Northern Route) of Block Island approaching Long Island Sound. Since this analysis was completed, the U.S. Coast Guard (USCG) issued its Waterways Suitability Report (WSR) in September 2006 which included a detailed analysis of specific LNG carrier routing from federal waters to the proposed FSRU which were based on Broadwater's originally proposed routes.

While the analysis does differ from the routes analyzed by Broadwater in its April 2006 analysis, the differences are slight and represent minimal changes to the analysis (See Figure A-1). The WSR analysis also includes information on the recommended traveling safety and security zones around LNG carriers transiting to the FSRU. These safety and security zones would extend two nautical miles in front of, one nautical mile behind, and 750 yards to either side of the LNG carrier.

In general, the analysis submitted April 2006 does not change based on information from the WSR, indicating that no major coastal features would be significantly impacted by the proposed LNG carrier or associated USCG-identified safety and security zone that likely will be enforced around the carrier as it transits to the FSRU location. The only exception to this is that Thermal Radiation Hazard Zone 3 (an unignited vapor cloud) could impact land along limited portions of the recommended transit route. Due to the conservative nature of the analysis, however, the potential for Hazard Zone 3 to impact land along the LNG carrier route is highly unlikely. A discussion of Hazard Zone 3 is described in Section 2.2.1 of Broadwater's October 2006 CZCC Supplement. . (See also Resource Report 3 [Fish, Wildlife, and Vegetation] for potential impacts on marine ecological resources.)

An LNG carrier will transit to the proposed FSRU on average once every two or three days. Based on preliminary routing, there are two routes that LNG carriers may take when entering Block Island Sound prior to entering Long Island Sound via the Race. These two routes include:

- The Northern Route, which runs between Block Island and Point Judith, Rhode Island; and
- The Southern Route, which enters Block Island Sound via the Montauk Channel.

For both routes, the LNG carriers would be nearest the shoreline as they enter Long Island Sound via the Race.

## **The Northern Route**

The Northern Route is assumed to start at the U.S. territorial border south and east of Block Island and follow a north-northwesterly course to the pilot station located north of Block Island. At this location, the LNG carrier would be approximately 4.3 nautical miles (nm) (5 statute miles) from Point Judith, Rhode Island. Along the remainder of the inbound transit from north of Block Island to the proposed FSRU location the carrier would follow a route that is not less than 3.3 nm (3.8 statute miles) from the shoreline of Rhode Island, Connecticut, or New York.

At Waypoint N2, near the Point Judith pilot station, the carrier would begin its westerly course toward the FSRU. Between waypoints N2 and N3 (*see* Figure A-1), the route is approximately half way between Block Island and Point Judith (approximately 4.3 nm [5 statute miles] from the Rhode Island shoreline and 4.8 nm [5.5 statute miles] from Block Island). At Waypoint 4 the LNG carrier would traverse south of Fishers Island (*see* Figure A-1). Between waypoints 4 and 5 at the Race, the LNG carrier would pass between Fishers Island and Valiant Rock and make its closest approach to land. At the closes point, an LNG carrier would be within 1 nm (1.2 statute miles) of Fishers Island. At Waypoint 5, prior to heading southwest toward the FSRU, the LNG carrier would be at its closest approach to Connecticut, approximately 3.3 nm (3.8 statute miles) from the Connecticut shoreline. From Waypoint 5, the LNG carrier would then head west, paralleling the Long Island shoreline until it connects with the FSRU at its proposed location in the Town of Riverhead, Suffolk County, New York.

The Northern Route is approximately 87 nm (100 statute miles) in length, and water depths exceed 100 feet (30.5 m) for the majority of the route.

## **Southern Route**

Arriving LNG carriers would approach the Southern Route from a northerly course beginning at the U.S. territorial border (*see* Figure A-1), on a heading toward the Montauk pilot station near Waypoint S2. Between waypoints S2 and S3, the LNG carrier would enter the Montauk Channel east of Montauk Point. At this location the LNG carrier route is approximately 6.1 nm (7 statute miles) from Montauk Point. The sea bottom in this channel is shallow, with depths ranging from 50 to 60 feet (15.2 m to 18.3 m) and shallow spots with depths down to 41 feet (12.5 m). After passing through the Montauk Channel, the depth increases to over 100 feet (30.5 m). At Waypoint S3, the route is approximately 3.9 nm (4.5 statue miles) from Block Island. From the Montauk Channel the route heads in a northwesterly direction (generally between waypoints S3 and 3) toward Fishers Island. Between waypoints 4 and 5, the LNG carrier would traverse in a west-northwesterly direction to south of Fishers Island. Thereafter, the route is the same as described for the Northern Route. The length of this leg is approximately 78 nm (90 statute miles).

Scheduling arrivals will take into account use of the area by other marine traffic and will require close cooperation between Broadwater, the USCG, pilots, and other operators (*see* Resource Report 11, Safety and Reliability). Scheduling of LNG carrier arrivals is a very important issue for Broadwater with respect to limiting impacts on other users of the Sound because a traveling, USGC-imposed safety and security zone will likely be enforced around the LNG carrier, which may limit use of the area adjacent to the carrier. Based on an anticipated carrier speed of 12

knots, the approximate duration of a traveling safety and security zone at any single point would be only approximately 15 minutes. Based on review of existing NOAA charts, the transiting LNG carrier would not result in any bottlenecks that would prevent other commercial or recreational traffic from transiting the Race.

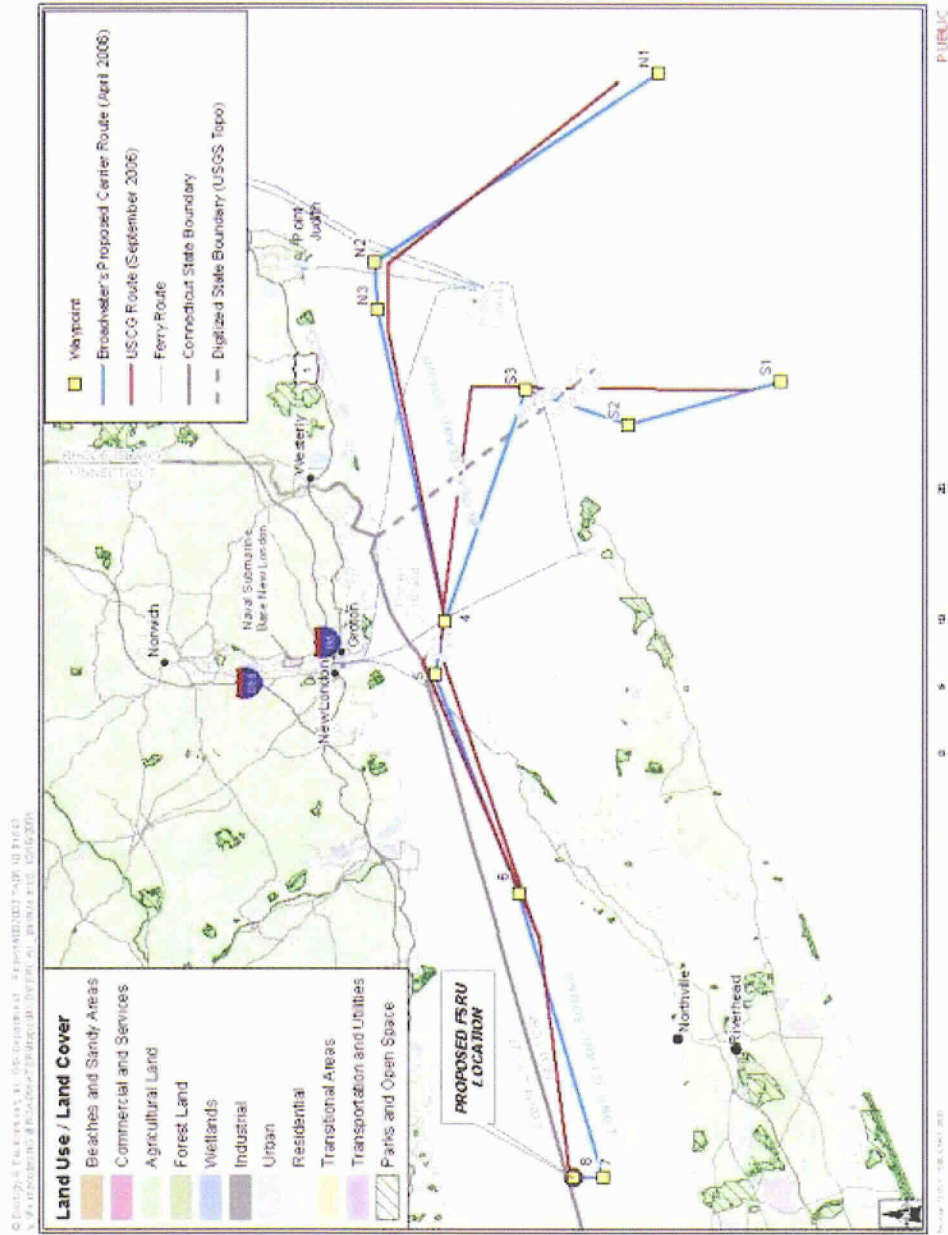


Figure A-1 Comparison of LNG Carrier Route Submitted in April 2006  
Coastal Zone Consistency Determination and USCG Waterway  
Suitability Report LNG Carrier Route, September 2006



In general, onshore/coastal land uses along the assumed LNG carrier routes do not differ substantially along the New York, Connecticut, or Rhode Island shorelines (see Figure A-1). The majority of the coastal land uses along these shorelines are a mix of forested and agricultural land, with some residential uses interspersed within this overall pattern. In addition, the overall population densities encountered along these routes are fairly consistent for all three states, with a majority of population densities ranging from 0 to 500 people per square mile (see Figure A-2). The exception of this is the coastal area around New London, Connecticut, and Westerly, Rhode Island, where densities increase substantially. As shown on Figure A-2, population densities in this area can exceed 3,000 people per square mile. Near New London and Westerly, however, it is expected that the LNG carrier would be a minimum of 4.3 to 6.1 nm (5 to 7 statute miles) from the Rhode Island/Connecticut shoreline.

The LNG carrier's closest approach to inhabited land would be 1.2 nm (1.4 statute miles) as it transits south of 3,200-acre Fishers Island. This 7-mile-long, 0.75-mile-wide island is located about 10.4 nm (12 statute miles) northeast of Orient Point, New York, and 3.5 nm (4 statute miles) south of Connecticut. Fishers Island has a permanent population of 269 people. The island is accessible only by boat or plane and is characterized as a high-end residential resort community with a small village, residential homes, and recreational amenities such as golf courses and resorts.

Montauk Point State Park is the largest coastal park occurring along the LNG carrier routes. The park, situated on the eastern tip of Long Island near the historic Montauk Lighthouse, is primarily forested. At its closest approach, the LNG carrier would be approximately 6.1 nm (7 statute miles) from Montauk Point. However, because of its topography the park offers wide-open, unobstructed views of the water at various points, and the LNG carrier may be visible from these locations. Because of the number of larger commercial vessels that currently utilize the Sound, users of this park are accustomed to offshore vessel traffic and will not be adversely impacted.

In addition, several smaller parks and open-space areas are located on the Connecticut shorelines; however, at its closest approach the LNG carrier would be over 3.5 nm (4 statute miles) from these coastal parks. As with Montauk Point State Park, users of these parks are accustomed to large commercial vessel traffic on the Sound and will not be impacted.

The Coast Guard's assessment leads it to the conclusion that no land areas along the LNG carrier transit route would fall within Hazard Zones 1 or 2. WSR §3.2.

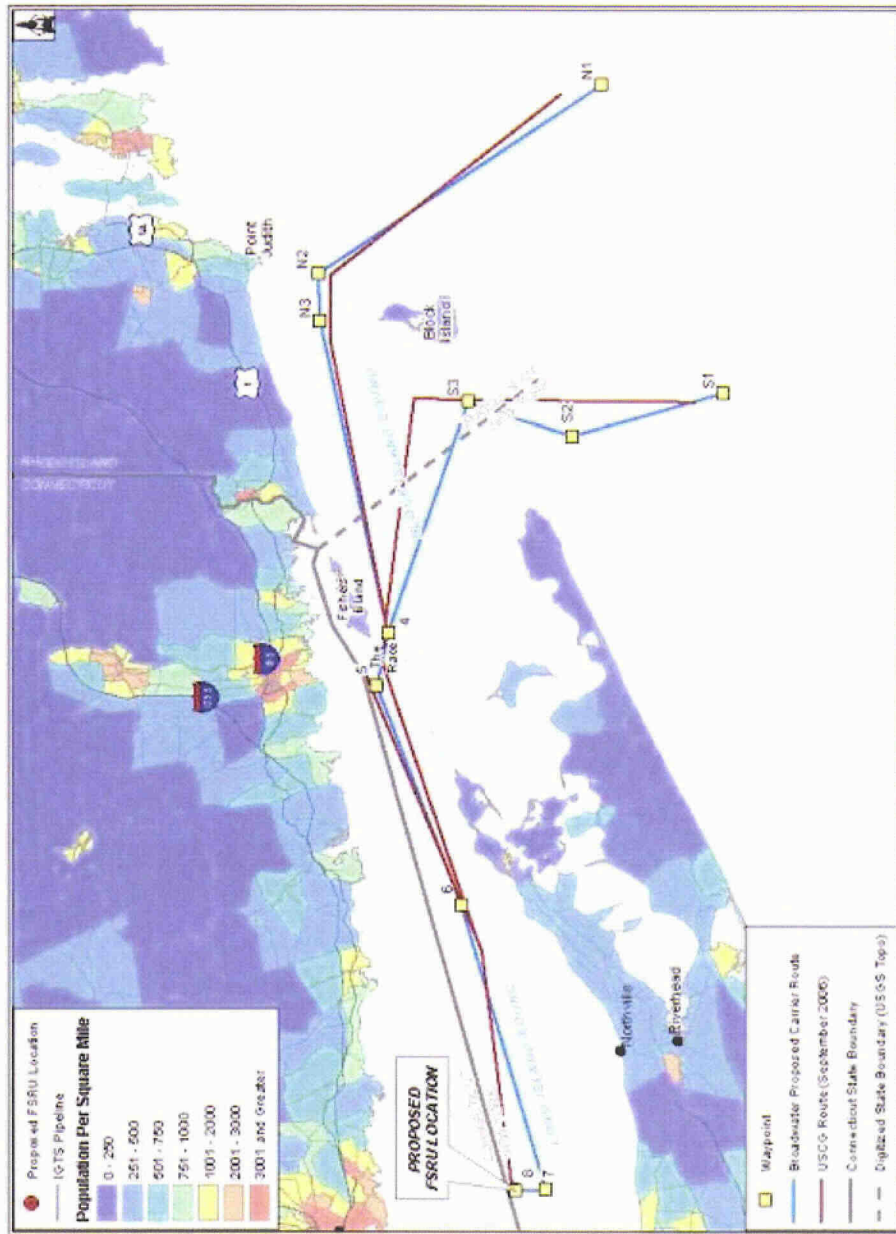
Hazard Zone 3, which carries the least level of risk and conservatively extends out to 4.3 miles from the moving LNG carrier, would overlap the following land areas:

- Northern tip of Block Island, Rhode Island;
- Southern tip of Weekapaug Point, Westerly, Rhode Island;
- Southern tip of Watch Hill, Rhode Island;
- All of Fisher's Island, New York;
- All of Plum Island, New York;

- Northernmost third of the North Ford of eastern Long Island; and
- A portion of Goshen Point straddling the City of New London and the town of Waterford.

In addition to traversing along coastal areas, the LNG carrier would also cross several existing ferry routes, specifically the Montauk-to-Block Island High Speed Ferry and the New London-to-Orient Point ferry routes. Potentially impacted ferry services and routes are discussed in more detail in Resource Report 8, Land Use, Aesthetics, and Recreation.

As mentioned previously, a discussion of impacts on marine ecological resources is provided in Resource Report 3, Fish, Wildlife, and Vegetation.



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Figure A-2 Population Densities in the Vicinity of the Proposed LNG Carrier Routes